**Before the**

**Federal Communications Commission**

**Washington, D.C. 20554**

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| In the Matter of | ) | |
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| | ) | GN Docket No. 17-108 |
| Restoring Internet Freedom | ) | |
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# Reply Comments of AARP

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## Overview of Reply Comments

AARP's review of the opening comments did not deliver many surprises. Most broadband ISPs and their supporters are in general agreement with the proposals in the *2017 NPRM* to reverse the *2015 Title II Order* and remove the Title II foundation for open Internet rules. Invariably, however, these parties do not adopt a reasonable public policy perspective. They discount the nature of Internet technology and fail to take into account key economic factors, such as the feedback between the edge and broadband demand, that enable the thriving Internet ecosystem. The parties that want to roll back Title II deny or overlook the existence of the virtuous circle and the intertwined nature of end-users, edge providers, and broadband ISPs. The recommendations of the broadband ISP's their supporters are not reasonable and should be rejected by the Commission. AARP believes that the *2015 Title II Order's* framework continues to be far more appropriate.

The record in this proceeding is expansive, and because of time and resource constraints AARP will summarize its review of the record in light of the *2017 NPRM's* proposed cost-benefit assessment of open Internet rules.[1] AARP's review of the comments indicates that the benefits of maintaining the *2015 Title II Order* outweigh the costs by a wide margin. The *2017 NPRM* pointed to the costs associated with alleged harms to broadband ISP investment as its primary consideration.[2] On this matter, the broadband ISPs and their supporters do not deliver any convincing evidence that broadband investment has been harmed in any way by the *2015 Title II Order*, or Title II in general. As recently noted by NCTA–The Internet & Television Association (the cable industry trade group), one indicator of broadband investment, U.S. broadband speed, indicates strong performance since the *2015 Title II Order*:

> Earlier this week, Akamai released its 2017 1st Quarter report and it revealed that on a number of key metrics, the internet in the United States took a huge leap forward compared to other countries. The US is now in the top ten countries for adoption of internet speeds over 15 and 25 Mbps as well as the top ten for overall average speed.
>
> But these gains aren't new or just limited to the last year. According to Akamai's research, broadband speeds in America over the last five years have increased from an average peak connection speed of 23.4 Mbps to 86.5 Mbps.
>
> *This near quadrupling of internet speeds in just five years is the result of constant innovation cycles and aggressive deployment of new technologies across the country.* Thanks to the constant process of growth and improvement, Gigabit cities are springing

[1] *2017 NPRM*, ¶¶105-115.
[2] *2017 NPRM*, ¶110.

> up across the country in both urban and rural communities, further driving average speeds into the stratosphere.[3]

Thus, according to NCTA, the period culminating in the impressive Akamai data for first quarter 2017 shows "innovation" and "aggressive deployment" of broadband. Such an outcome can only result from corresponding investment activity. It is important to note, however, that in this proceeding NCTA tells the Commission a completely different story: "The chilling effects of Title II already have begun to be felt in the form of decelerating broadband network investment. Such decelerating investment, in turn, means decelerating broadband speed increases…"[4] NCTA cannot have it both ways. The Akamai data that NCTA elsewhere touts do not support the proposition that broadband investment has been harmed by Title II.

Regarding investment under Title II, consultants supporting Verizon's comments in this proceeding also point to robust broadband investment in the post *2015 Title II Order* period. According to Verizon's Compass Lexicon consultants, mobility broadband markets exhibit strong evidence of investment under Title II.

> The *significant investments* and vigorous competition between wireless providers has led to a rapid increase in output of wireless broadband services, both in terms of consumer connections and usage. *For instance, wireless broadband connections have increased by approximately 40 percent between June 2013 and June 2016*.[5]

Verizon's Compass Lexicon consultants find that wireless industry performance under Title II has been impressive.

However, despite this evidence of strong investment performance under Title II (and additional evidence that is discussed in these reply comments), broadband ISPs and their supporters attempt to cite other "evidence" to support claims that Title II has harmed investment. Even if one ignores the fact that these "harmed investment stories" focus exclusively on broadband ISPs, and thus ignore the potential impact of the repeal of *2015 Title II Order* on edge providers and consumers, AARP finds that the broadband ISP "harmed investment stories" are based on weak theoretical expositions and deeply flawed empirical studies. Once the surface of these theories and studies is scratched, it is clear that there is no evidence to support the proposition that Title II has harmed broadband investment. In fact, as was discussed by AARP in opening comments,[6] and will be discussed further in these reply comments, evidence points to the association of Title II with high levels of investment.

Regarding the benefits of the open Internet, it is clear from AARP's review of the comments that they are substantial. The record provides compelling evidence of the benefits associated with

[3] NCTA, "America's Internet Speeds Continue to Soar," June 2, 2017, emphasis added. https://www.ncta.com/platform/broadband-internet/americas-internet-speeds-continue-to-soar/
[4] NCTA Comments, pp. 1-2.
[5] *Verizon/Compass Lexicon* report, p. 25, ¶63. Filed with Verizon's July 17, 2017 comments.
[6] AARP comments, pp. 60-71.

innovation, competition, economic development, free speech, healthcare, and education arising from the Title II foundation of open Internet rules.

To summarize some of these benefits, AARP refers the Commission to the excellent comments filed by "Internet Engineers, Pioneers, and Technologists," a group including Vint Cerf, who is recognized as the "father of the Internet." The quote below, delivers a very clear statement of the substantial benefits of enforceable open Internet rules, and clearly explains why the Commission must reject the proposals in the *2017 NPRM*:

> As developers, engineers, and designers, we realize that without openness and neutrality the Internet as we know it will cease to exist, because it is that openness and neutrality that gives the Internet its flexibility, leads to its growth, and has made it a vital resource for all aspects of modern life. Based on legal analysis done by others we are concerned that if the FCC proceeds with this NPRM and reclassifies BIAS providers as information services, it will be unable to enforce the light-touch, bright-line rules the FCC promulgated as part of the 2015 Open Internet Order. We believe those light-touch rules are essential to the continued innovation and flexibility of the Internet. Thus the NPRM, if approved, would decimate the openness and neutrality that have contributed to the Internet's explosive growth over the past several decades. Further, service providers could and would revert to engaging in the practices of blocking, throttling, and interference. These practices would upend the Internet, making development of new protocols and services dramatically more difficult, breaking existing protocols and services, and even introducing security vulnerabilities that would not have been present without service provider interference. In short, if the current rules are not preserved, the rapid pace of innovation the Internet has experienced over the last forty years could come to a disastrous halt. We urge the Commission to reject the NPRM.[7]

The prevention of harms to consumers and edge providers is a key benefit of the *2015 Title II Order's* enforceable open Internet rules, and the Commission must recognize that this benefit is substantial.

The prospect of blocking, throttling and interference raised by AARP,[8] the Internet Engineers, Pioneers, and Technologists, and other parties[9] is a real threat, and is clearly demonstrated in the comments of the New York Attorney General (NYOAG). NYOAG provides compelling evidence of broadband ISP abuse, and clearly illustrates that broadband ISPs recognize their market leverage, and are willing to exercise their market power to improve their bottom line:

> The interconnection disputes examined by NYOAG demonstrate that large BIAS providers leveraged and, absent regulation, will continue to leverage, their privileged

[7] Joint Comments of Internet Engineers, Pioneers, and Technologists on the Technical Flaws in the FCC's Notice of Proposed Rule-making and the Need for the Light-Touch, Bright-Line Rules from the Open Internet Order, p. 31.
[8] AARP comments, *passim*.
[9] See Sections III through VI of these reply comments.

> positions as gatekeepers to extract payments from backbone and edge providers at the expense of their customers. And the evidence that BIAS providers acted in this manner in the context of interconnection is the best evidence of how they will act in other contexts (e.g., blocking, throttling, paid prioritization). Indeed, it was the Commission's regulation of interconnection arrangements through Title II in the 2015 OIO [Open Internet Order] that largely ended ongoing interconnection disputes. The Commission must retain all of the protections found in the 2015 OIO to prevent BIAS providers from engaging in this type of conduct in the future.[10]

From the context of a benefit-cost analysis, the record in this proceeding demonstrates that the costs of enforceable open Internet rules, such as those enabled by the *2015 Title II Order*, are *de minimis*. The record also demonstrates that the benefits of enforceable open Internet rules are substantial and growing. AARP strongly urges the Commission to reject the *2017 NPRM's* proposals, and to continue to support the rules established with the *2015 Title II Order*, using the Title II classification that has been demonstrated to provide the needed legal foundation. This course of action will protect the expansive benefits for innovation, competition, economic development, free speech, healthcare, and education that are associated with the permissionless open Internet ecosystem.[11]

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[10] The People of the State of New York by Attorney General Eric T. Schneiderman, comments, pp. 10-11.

[11] "[T]he Internet has thrived because of its freedom and openness—the absence of any gatekeeper blocking lawful uses of the network or picking winners and losers online. *Consumers and innovators do not have to seek permission before they use the Internet to launch new technologies, start businesses, connect with friends, or share their views.* The Internet is a level playing field. Consumers can make their own choices about what applications and services to use and are free to decide what content they want to access, create, or share with others. This openness promotes competition. It also enables a self-reinforcing cycle of investment and innovation in which new uses of the network lead to increased adoption of broadband, which drives investment and improvements in the network itself, which in turn lead to further innovative uses of the network and further investment in content, applications, services, and devices. . . ." *2010 Open Internet Order*, ¶3, emphasis added.

# I. Introduction

AARP respectfully submits these Reply Comments for the FCC's consideration, and thanks the Commission for the opportunity to participate in this important proceeding. The *2017 NPRM*[12] has produced a substantial record of evidence for the Commission to consider, with over twelve million comments filed. Many of these comments are from individuals, and often contain just a few lines. The Commission has also received thousands of more substantial comments from a wide variety of parties, expressing a wide variety of positions regarding the issues raised in the *2017 NPRM*. AARP does not pretend that it has reviewed all the filed comments, and if AARP does not respond to a specific party or argument, it should not be interpreted as a concession of the issue by AARP.

With a focus on major filers, and a sampling of other comments, AARP finds that AARP's opening comments are consistent with most filers who support open Internet principles. Similarly, AARP's opening comments anticipate many of the arguments raised by parties who, consistent with the themes of the *2017 NPRM*, propose that the Commission repeal the Title II classification associated with the *2015 Title II Order*.[13] As a result, AARP's opening comments already provide rebuttal of many of the points raised in comments by those opposing Title II. In the reply comments below, AARP will provide additional information for the Commission to consider.

The opening comments do not provide many surprises. Broadband ISPs oppose Title II, and place significant effort into attempts to demonstrate harms to investment. However as will be

[12] *In the Matter of Restoring Internet Freedom*, WC Docket No. 17-108, Notice of Proposed Rulemaking, May 23, 2017. Hereinafter, *2017 NPRM*.
[13] *In the Matter of Protecting and Promoting the Open Internet*, GN Docket No. 14-28, Report and Order on Remand, Declaratory Ruling, and Order, March 12, 2015, hereinafter *2015 Title II Order*.

discussed in detail below, the efforts of broadband ISPs and their supporters fall short, and do not advance the proposition that the *2015 Title II Order* harmed investment any further than the three studies cited in the *2017 NPRM*, studies that AARP rebutted in opening comments.[14] AARP emphasizes that no party in the opening comments has provided any information that has led AARP to change its conclusions, and AARP continues to urge the Commission to maintain the classification of broadband Internet access services under Title II, and to maintain the regulatory framework contained in the *2015 Title II Order*.

Returning to Title I all but assures that the Commission will not be able to support "Internet freedoms." Instead of protecting Internet freedoms, Title I classification will result in the Commission picking winners in the Internet ecosystem, and those winners will be broadband ISPs. Because of continuing market power in broadband markets, with the overwhelming majority of consumers facing wireline duopolies or monopolies, and edge providers facing terminating monopolies, the abandonment of Title II will result in the Commission tipping the balance in favor of broadband ISPs, which have the potential and incentives to become "gatekeepers" who will disrupt the virtuous circle of investment and innovation. The disruption of investment and innovation will harm economic activity, social communication, and the future of the broadband Internet, the most important telecommunications technology platform that has ever been created.

These reply comments provide a brief review of the comments of consumers, consumer representatives, and edge providers on the matter of the costs and benefits of the framework established by the *2015 Title II Order*. This reply will then turn to proposals and economic

[14] AARP comments, pp. 48-72 and 102-111.

analyses submitted by broadband ISPs and other parties. These comments conclude that the Commission's *2015 Title II Order* is consistent with the principles of cost-benefit analysis—the benefits of enforceable open Internet rules far exceed the costs of the existing light-touch regulatory framework.

## II. Public policy objectives must extend beyond broadband ISP investment

In opening comments, AARP noted that the *2017 NPRM* adopted an overly narrow focus that ignored the impact of the Commission's network neutrality framework on investment by entities other than broadband ISPs.[15] AARP noted that the Commission has previously recognized that the value of the Internet to a consumer is not the broadband connection alone, but is instead driven by the content and services that are available at the network edge. This previous recognition of a broad impact of network neutrality policy led to the Commission's "virtuous circle" approach, which linked investment at the network edge and investment in broadband Internet access facilities, and a broad impact on social welfare.[16] Other parties emphasize similar arguments. For example, Computer and Communications Industry Association state:

> The NPRM, on its face, appears to be very concerned about the effects that regulation can have on investment, yet by pursuing this action, the Commission is not considering at all how re-reclassification could affect the vast Internet ecosystem and the burgeoning economic growth it has created. Relying on two overly-simplistic studies to justify re-reclassification of BIAS would not only be misleading, but it would also be a dereliction of the Commission's duty to consider the whole record that is developing through this notice and comment process. Instead of pursuing this NPRM, the Commission should consider how "re-reclassification" would affect not just the twelve biggest ISPs, but the entire economy. The Commission should consider overall investment, which would be

[15] AARP comments, p. 48.
[16] *In the Matter of Preserving the Open Internet, Broadband Industry Practices*, GN Docket No. 09-191, WC Docket No. 07-52, Report and Order, December 23, 2010, ¶¶14 & 38. Hereinafter, *2010 Open Internet Order*.

> threatened by abdicating its authority to ensure that network providers abide by the so-called "net neutrality" principles of no blocking, no throttling, and no discrimination.[17]

AARP also agrees with New York University Professor Nicolas Economides on the proper public policy focus:

> The goal of public policy, such as the network neutrality rules, is to maximize the total public benefit to participants of the Internet ecosystem that includes consumers/users, applications and content providers, and ISPs. Investment by ISPs is one of the variables that may contribute in public benefit. It is not the appropriate measure of the public benefit to the ecosystem. Instead of focusing on ISP investment, we should look carefully at all aspects of the impact of the regulation. As discussed earlier, there are very significant benefits of network neutrality to applications and content providers sector, including investment in that sector, as well as substantial benefits to consumers.[18]

Microsoft also recognizes the need for a broad perspective, and correctly points to the guiding statutory mandate that requires this Commission to adopt a broad perspective:

> More problematic, however, is the NPRM's exclusive focus on the broadband internet access service provider corner of the internet economy. While robust broadband internet access networks are critical in allowing consumers to gain access to edge services, the Internet economy is much more than just those broadband internet access networks. The internet economy includes all the hardware, software, and network infrastructure of all participants in the internet economy, including all the applications, content, and services available through the internet. It encompasses both the connections between consumers and edge service providers and the applications, content, and services facilitated by those connections. Correspondingly, the goals of promoting greater innovation and investment in the internet economy should be important goals across the entirety of the internet economy.
>
> The avowed policy of Congress, and thus of the Commission, is to "promote the continued development of the Internet," not the promotion of broadband internet access service providers or any other specific component of the internet. By focusing solely on investment by broadband internet access service providers, the NPRM fundamentally misperceives the scope of the Commission's statutory public policy objectives. The Commission should broaden its perspective—to reflect the entirety of the internet economy—in evaluating the merits of its open internet rules.[19]

[17] Computer and Communications Industry Association comments, pp. 4-5.
[18] Nicholas Economides comments, pp. 5-6.
[19] Microsoft comments, pp. 3-4.

Similarly, New Media Rights states:

> The public policy benefits of treating BIAS as a telecommunications service, regulated under Title II, are significant. We pointed out some of them in our comment three years ago. Regulatory clarity and certainty; Court-tested and Court-approved regulatory authority; the requisite authority to effectively check the increasingly consolidated BIAS market; it seems absurd to claim that these are not public policy benefits. And yet this Commission has proceeded to do so, making specious claims about decreased investment, opposition by small internet service providers ("ISPs"), regulatory uncertainty, and a lack of consumer benefits due to there being only "hypothetical" harms as a result of ISP behavior. We strongly disagree with the Commission's analysis. . .[20]

The Internet Association states:

> Net neutrality is about not just investment by ISPs, but also investment by providers of edge-based apps and services and consumers of those services. Investment in the cloud economy has been booming since 2015.[21]

The Commission has previously recognized the value of the Internet is not the broadband connection alone, but is instead driven by the content and services that are available at the network edge. The Commission has previously (and correctly) recognized that there is a "virtuous circle" between investment at the network edge and investment in broadband Internet access facilities.[22] The Commission must expand the *2017 NPRM's* overly narrow perspective, and consider the entire Internet ecosystem—edge providers, consumers, and broadband ISPs. Such a consideration indicates that the *2015 Title II Order* established a reasonable framework for ensuring the continuing success of the Internet. Fortunately for the Commission, the record in this proceeding provides ample evidence that enables the necessary broad public policy perspective, and clearly identifies the expansive benefits of supportable open Internet rules for all stakeholders, including those other than broadband ISPs.

[20] New Media Rights, opening comments, pp. 7-8.
[21] Internet Association comments, p. ii.
[22] *2010 Open Internet Order*, ¶¶13-14.

## III. Citizens identify the need for, and benefits of, the *2015 Title II Order*

Many citizens have engaged in this proceeding, with millions of individual comments filed, and other citizen input also appearing in petitions, such as the one filed by CREDO Action, which contains over 190,000 signatures. The CREDO Action petition simply reads "Don't kill net neutrality. Preserve the FCC's Title II authority to protect the internet."[23] AARP reviewed some of the citizen comments that have been filed in this proceeding, and it stands out that the issues are clear to many of these individuals—consumers recognize the lack of broadband competition and the potential for broadband ISPs to harm the Internet ecosystem. Consumers also recognize that the *2015 Title II Order* has provided rules needed to protect them and the Internet. Verbatim excerpts from a few citizen comments are provided below:

> I believe the establishment of broad, yet enforceable national rules for Open and Fair Access to the Internet is clearly required given the intertwined business and ownership relationships between telecommunications companies and content/entertainment companies. Fair and Open Internet Access must be protected and guaranteed by the government just as access to any other critical national infrastructure such as the interstate electric power gird, our U.S. Mail system, and our national highway system. The FCC initiated the "Clear, Bright-Line Rules" for an Open Internet in 2010 and again strengthen them in 2015 to address the dangerous trends already evident in the behaviors of Broadband Internet Access providers. I believe these existing rules are in the best interests of American citizens and businesses and do not discourage investment in broadband Internet Access.[24]

> Without Net Neutrality rules isp providers will have a dominating reign on how business is conducted on the internet and will create an unlevel playing field that will stifle small internet startups, create a rigged competitive model, and hamper peoples access to information. Currently there is not enough isp competition at local levels to ensure isp's provide quality service without these rules in place. Several consequences for repealing the rules could arise such as internet prices for the average consumer going up and people

[23] CREDO Action comments.
[24] Comments of W.J. Krause.

> having problems accessing sites that isp's disagree with. It is important that these rules be retained for the best interest of the internet and the country.[25]

> I'm worried about creating a tiered Internet with "fast lanes" for certain sites or services because I think that doing so would give ISPs too much power to determine what I can do online. In addition, I believe that users like me will have fewer options and a less diverse internet if net neutrality safeguards are removed. "Fast lanes" for big sites would be a deterrence for small, new, innovative companies to succeed – those are the types of companies I want to support, so the idea of "pay to play" on the Internet is abhorrent to me.[26]

> Thankfully, the existing net neutrality rules ensure that ISP monopolies can't slow or block Internet users' ability to see certain websites or engage in data discrimination by charging online services and websites money to reach customers faster. That's exactly the right balance to ensure the Internet remains a level playing field that benefits small businesses and consumers as well as larger players. Chairman Pai's proposed repeal of the rules would help turn ISPs into gatekeepers with the ability to veto new innovation and expression. That's not the kind of Internet we want to pass on to future generations of technology users.[27]

> I would be extremely hard-pressed to find a single person who uses the internet, who would say that stringent, well-enforced net neutrality rules should not be in place, at least not once they've read enough about the issue to understand what's being discussed. Certainly none of them would agree that service providers ought to be able to discriminate against certain content, or give preferential treatment to certain web sites or content providers who have paid the ISP. They would rightfully say that, as a customer of their ISP, their ISP is already being paid by them to deliver whatever bits they have requested, and that any attempt to extract additional payment for those bits from the sender would at best be unethical double-dipping and profiteering.[28]

On the other hand, Thomas A. Giovanetti, President of the Institute for Policy Innovation, has a different perspective on citizen comments: "we urge the FCC to ignore efforts to flood the

[25] Comments of Jonathan Wolfson.
[26] Comments of Lotta Danielsson.
[27] Comments of Eileen Dyer, p. 1.
[28] Comments of Gregory Poucher.

Commission with millions of identical or similar comments ginned up by interest groups, and to focus on the strength of the economic and legal arguments submitted in good faith to the Commission."[29] It is unreasonable to disregard public statements of citizens who believe one way or another about network neutrality. Ultimately the Commission's decisions must be in the public interest, and the FCC should be aware of what citizens think, even if statements are only a few words.

## IV. Consumer representatives and advocacy groups identify the need for, and benefits of the *2015 Title II Order*

Many groups and individuals that represent the interests of consumers of Internet content, applications, and services emphasize the need for the protections provided by the *2015 Open Internet Order.* For example, mayors from 62 U.S. cities, representing 26 million Americans, emphasize the importance of net neutrality rules to provide a level playing field:

> Our nation's residents benefit immensely from an open internet, which drives innovation and economic growth across every segment of American society. "Net neutrality" rules recognize the importance of maintaining a level playing field for all internet content – regardless of the creator or owner – to be enjoyed by all users, regardless of their internet provider. For this reason, the U.S. Conference of Mayors has consistently advocated for strong federal actions on this issue across two federal administrations.[30]

Senator Al Franken discusses, among other factors, the harms that can arise from fast lanes:

> Without the prohibitions against blocking, throttling, and paid prioritization, ISPs will be free to discriminate against, or in favor of, particular content, applications, or services online by blocking, slowing down, or otherwise interfering with consumers' access to lawful content. With respect to paid prioritization, the FCC has explained that it could result in a well-functioning internet for those wealthy enough to afford it and a congested, low-quality internet for everyone else. Paid prioritization would also create new costs for consumers. As companies pay ISPs for priority treatment, those companies will

[29] Comments of Thomas A. Giovanetti President Institute for Policy Innovation (IPI) Supporting the Rulemaking, p. 1.
[30] Comments of 62 Mayors, July 17, 2017.

> undoubtedly pass along such costs to consumers in the form of higher subscription fees or product prices. Other companies that are unable to pay the fee would be unable to compete vigorously as a result. Facing reduced competitive pressures, well-funded, established corporations could leverage their market position in the form of higher prices. Notably, the threat of paid prioritization is not just theoretical—certain ISPs have admitted a desire to negotiate pay-for-priority deals with edge providers.[31]

Co-chairs of the Congressional Progressive Caucus, Raúl Grijalva and Mark Pocan highlight the importance of network neutrality to promote innovation, education, democratic engagement, and civic empowerment:

> The Internet empowers people from all backgrounds, whether privileged and powerful, or traditionally marginalized, to elevate their message and have a voice. It is an increasingly fundamental tool for leveling play fields, for innovation, education, democratic engagement, and civic empowerment. Preserving the current Title II protections is essential to upholding the Internet's egalitarian ability to raise all voices. As progressives, we believe that the Federal Communications Commission should uphold Title II protection for Net Neutrality.[32]

Consumers Union points to the appropriateness of continuing the bright line rules and general conduct standard, and emphasizes the continuing need to prevent paid prioritization and fast lanes:

> Before allowing paid prioritization, policy makers should consider how consumers and all users of the internet would be impacted. As we mentioned in 2014, we fear if paid prioritization is allowed, ISPs may charge an "admissions toll" to edge providers to even access consumers online. With new expenses to operate, edge providers could then pass those costs onto consumers in the form of higher prices or reduce the number of free services. We are also concerned that consumers may find it necessary to purchase prioritized access plans to continue to enjoy the level of service they have today. Without a fast lane, the remaining non-prioritized traffic could be slowed down or degraded in what would amount to a "slow lane" for anyone not able to afford a higher priced prioritized plan.[33]

[31] Senator Al Franken comments, p. 3.
[32] Comments of Raúl Grijalava and Mark Pocan, Co-chairs of the Congressional Progressive Caucus.
[33] Consumers Union comments, p. 15.

The impact on consumer bills and video competition was raised by "Stop the Cap!"

> It seems unlikely consumers will be the winners in any change of Open Internet policies. Claims that usage caps or paid prioritization policies benefit consumers with lower prices or better service are illusory. One thing is real: the impact of throttled or degraded video content which can be a major deterrent for consumers contemplating disconnecting cable television and relying on cheaper internet-delivered video instead.[34]

Public Knowledge and Common Cause state:

> Title II classification ensures consumers are protected, universal service advances, and there is growing competition in the broadband marketplace. If the Commission reverses course and classifies broadband under Title I, it must sufficiently explain how it will provide for protections that consumers not only enjoy but have come to expect in the broadband marketplace.[35]

Pointing to the needs of consumers with disabilities, Telecommunications for the Deaf and Hard of Hearing, Inc. et al. state:

> [C]onsumers with disabilities are ever more governed in their ability to use the internet on equal terms by the network practices of broadband internet access service (BIAS) providers. As a result, it is critical that the Commission:
>
> - Maintain the transparency rule to ensure that consumers with disabilities can better understand how BIAS provider plans, terms, and practices will affect their ability to use the applications and services of their choice;
> - Maintain the no-blocking rule to ensure that consumers with disabilities are not discriminated against in their ability to use applications that consume significant bandwidth; and
> - Maintain the no-throttling, no-paid-prioritization, and general conduct rule to maintain a healthy ecosystem for the development of accessible applications.[36]

[34] Stop the Cap! comments, p. 3.
[35] Public Knowledge and Common Cause comments, p. 87.
[36] Telecommunications for the Deaf and Hard of Hearing, Inc. (TDI), National Association of the Deaf (NAD), Hearing Loss Association of America (HLAA), American Council of the Blind (ACB), Association of Late-Deafened Adults (ALDA), Cerebral Palsy and Deaf Organization (CPADO), Deaf and Hard of Hearing Consumer Advocacy Network (DHHCAN), Deaf/Hard of Hearing Technology Rehabilitation Engineering Research Center (DHH-RERC), Universal Interfaces and Information Technology Access Rehabilitation Engineering Research Center (UIITA-RERC) comments, p. 2.

The National Association of Utility Consumer Advocates illustrates the telecommunications element of consumers' use of ISP services:

> The no blocking rule, and the associated no paid prioritization and no throttling rules, are essential to consumer freedom to access the content of their choice without interference. These rules, which address the unimpeded transmission of content, chosen by the consumer, without alternation, reflect consumer expectations and demonstrate that broadband Internet access service functions as a Title II, telecommunications service. . . . Consumers expect their ISP to simply transmit their keyboard commands so they can freely use the Internet content without interference. That is the very definition of a telecommunications service.[37]

National Consumer Law Center and United Church of Christ also emphasize the importance of anti-blocking and anti-discrimination rules, and the difficulty that the Commission will have enforcing these rules under Title I:

> There are strong reasons for concern regarding the Commission's ability to protect consumers from their Internet Service Provider blocking content, throttling select usage, or accepting paid prioritization of content if broadband internet service is classified as a Title I information service. In a prior attempt to rely on Title I authority for open internet rules, the Commission's anti-discrimination and anti-blocking rules were considered common carrier, Title II obligations and rejected by the D.C. Circuit. Thus, the soundest path forward toward protecting consumer's expectations of free and open broadband internet service is to refrain from this dangerous reclassification exercise and to keep broadband internet service a Title II telecommunications service.[38]

The Greenlining Institute raises both economic and political reasons for supporting the Title II approach:

> Adopting the proposed rules will also reduce the diversity of perspectives and voices available on the internet, and those voices will be from communities of color. The 2015 Open Internet Order protected those communities from this inequity by mandating equal treatment for all perspectives and views on the internet, and preventing ISPs from charging more for "priority" access to content. The commission should reject any effort to reclassify broadband because it will harm communities of color by hampering efforts

[37] National Association of Utility Consumer Advocates comments, p. 11.
[38] National Consumer Law Center and United Church of Christ OC comments, p. 8.

> to close the digital divide, widening the racial wealth gap and threatening our shared values in free speech, civic participation, and equality.[39]

Electronic Frontier Foundation warns of the dangers of reversion to Title I:

> The Commission's proposal to remove net neutrality's legal foundation by moving broadband access to Title I would give a green light to BIAS providers' frequent interference in their customers' Internet use. It would accelerate the use of unwanted blocking, throttling, and modification of others' data transmissions, whether for commercial advantage or private preference. It would threaten freedom of speech—a core American value—and smother innovation by those without the cash or luck to affiliate with major Internet access providers. The Commission should turn away from this reckless course.[40]

Access Humboldt, a non-profit community media organization serving Humboldt County California states:

> Local community voices, especially for remote rural and low income folks, require an open internet to protect us from potential abuses of absentee owners and profiteers who seek to manipulate and control the marketplace of ideas. We support the rules put in place under Title II designation of Internet service.[41]

The comments of these representatives of consumers and citizens clearly point to the continuing appropriateness of Title II classification of broadband ISP services, and the need for enforceable open Internet rules, such as those enabled by the *2015 Title II Order.* Like AARP, these parties believe that Title II promotes a vibrant and competitive Internet ecosystem that is essential for social and economic progress. Absent enforceable open Internet rules that limit market power in last-mile broadband networks, the growth of broadband benefits will be limited, and undue power will be handed to broadband gatekeepers who could disadvantage end users, as well as suppliers of Internet content and services. The Commission must recognize that the existing framework, based on the *2015 Title II Order,* generates a wide variety of benefits for consumers.

[39] Greenlining Institute comments, pp. 3-4.
[40] Electronic Frontier Foundation comments, p. 30.
[41] FCC Open Internet Comments of Access Humboldt, p. 1.

Some of the benefits are economic, and flow to consumers in the form of free or low-cost content or information, or in the form of competition in markets that have previously been dominated by monopolies, such as television programming. However, other benefits are more difficult to measure, but are nonetheless substantial. For example, the potential impact of the repeal of supportable open Internet rules on free speech and civic empowerment would strike at core democratic principles that our society values highly. Historically, citizens have risked their lives and property to protect these principles, indicating that they are among the most valued elements of our society. The Commission must not disparage or endanger these highly valued benefits of enforceable open Internet rules.

## V. Edge providers identify the need for, and benefits of, the *2015 Title II Order*

As discussed in AARP's comments, the *2017 NPRM* focuses on the purported impact of the *2015 Title II Order* on broadband investment by ISPs in isolation—the *2017 NPRM* does not reasonably consider the impact of network neutrality on investment at the network edge, for either major edge providers that produce Internet applications, content, or services, or by end-users to enable their smaller-scale production of Internet content. As the Commission has previously recognized, the value of the Internet to a consumer is not the broadband connection alone, but is instead driven by the content and services that are available at the network edge. The Commission has previously (and correctly) recognized that there is a "virtuous circle" between investment at the network edge and investment in broadband Internet access facilities.

In comments, edge providers, such as the Computer and Communications Industry Association illustrate the need for enforceable rules, and the leverage that broadband ISPs have over small edge providers:

> The Commission should recognize the practical effects of these rules – they foster competition and network investment, and they facilitate innovation. If there were no such "rules of the road" for the Internet, BIAPs (broadband Internet access providers) would be free to charge tolls for reaching certain types of content and services online. Small businesses and startups generally do not have the financial resources for the fast lanes that a BIAP would be able to create under the NPRM. Nor do they have the bargaining power to negotiate more favorable terms with a large BIAP. They rely on the Internet to build their businesses, advertise their products and services and attract customers. The NPRM would impose not only financial costs on small businesses and innovators, it would also close off opportunities from them to grow.[42]

The Internet Creators Guild, representing 330 online creators, explain how creative activities will be harmed if permissionless innovation is threatened:

> We agree with the overwhelming majority of Americans who support strong net neutrality protections, and do not think telecom companies should be given powers to block or slow services online.
>
> ISPs like Comcast could become gatekeepers of the Internet, using their powers to favor certain content based on how much they can pay, or which companies have a seat at the table. There are also conflicts of interest where the largest ISPs own media outlets, and can give more favorable treatment to their content over our creations.
>
> These regulatory changes will give ISPs immense influence over how we as creators can connect with each other and our audiences. If real Title II net neutrality is lost, we will lose the permissionless innovation that has made creativity on the Internet so great. Internet providers will have new influence over how we as creators can connect with each other and our audiences, which will have major implications for the diversity of voices available online.[43]

Internet Infrastructure Coalition discusses the beneficial outcomes of constraining gatekeeper power, including the promotion of innovation and competition at the network edge:

> For our members, the Title II Order represents a success for our industry. It ensures that the FCC retains the ability to create an open and transparent marketplace serving all comers. With this transparent marketplace, technology companies innovate to deliver services in creative ways that move the entire industry, and the economy of the United States, forward. A winner is determined by the market, rather than a gatekeeper. This

[42] Computer and Communications Industry Association comments, p. 9.
[43] Internet Creators Guild comments, 2nd page.

> benefits the entire Internet ecosystem. The Title II Order facilitates innovation and ensures a healthy Internet.[44]

Illustrating the broad benefits of network neutrality, the Internet Association states:

> The success of the cloud economy and the transformation of the Internet into an indispensable part of daily life is largely based on a free and open Internet, one that enables consumers to access any website or app, buy any product, and use any service they choose. Net neutrality rules enable an ecosystem of "innovation without permission" in which anyone with a good idea can launch an app without having to strike a deal with an ISP or worry about whether an ISP will block, throttle, or otherwise discriminate against a service. Moreover, following the virtuous circle of broadband innovation, a free and open Internet benefits the entire ecosystem — ISPs who benefit from greater demand for their services from consumers, edge providers and startups who innovate knowing that their services will reach their customers without interference from ISPs acting as gatekeepers, and most of all consumers and small businesses who benefit from the wide range of innovative services available through the broadband ecosystem.[45]

Vimeo discusses the importance of network neutrality to edge investment, and also discusses the growing role of small edge providers to deliver Internet content:

> Vimeo is an example of an online video service that has flourished due to network neutrality. Vimeo's success as a video platform depends upon its ability to deliver a high-quality viewing experience to its users at a predicable cost that has historically decreased, on a per unit basis, over time. If broadband providers could block, throttle, or charge arbitrary fees, Vimeo's incentive to make capital investments would be severely reduced. Not having to worry about arbitrary decisions by broadband providers has allowed Vimeo to provide users with increasingly bandwidth-intense innovations, such as allowing users to upload videos without length restrictions (since inception); allowing users to upload full HD videos (in October 2007); providing a fully open video sales platform (i.e., Vimeo on Demand, launched March 2013) that returns 90% of revenue to the creator after transaction costs; and launching a marketplace for 360 video (March 2017).[46]

Digital Ocean also emphasizes the need for network neutrality to protect smaller edge providers:

> Our market is dominated by some of the largest Internet companies in existence today, namely Google, Amazon, and Microsoft. Because the elimination of Title II

[44] Internet Infrastructure Association comments, p. 2.
[45] Internet Association comments, p. 8.
[46] Vimeo comments, p. 9.

> categorization would impose costs upon cloud infrastructure providers that market leaders are better positioned to absorb, protections against blocking, throttling, and paid prioritization are thus critical to our ability to compete fairly in this market. Without the protections defined by Title II, incumbents would be able to seize an artificial advantage in the market, and this would adversely impact our business and our customers.[47]

The comments of a coalition of higher education providers point to problems that will emerge for educational institutions and educators should non-neutral practices be introduced, such as paid prioritization:

> The harm from paid prioritization will occur because many institutions that serve the public interest, such as libraries, colleges and universities, will often not be able to afford to pay the extra fees simply for the transmission of their content. As such they could find their Internet traffic relegated to chokepoints (the "slow lane") while prioritized traffic zips through to its destination. Paid prioritization inevitably favors those who have the resources to pay for expedited transmission and disadvantages those entities – such as higher education and libraries – whose missions and resource constraints preclude them from paying these additional fees.[48]

ADT emphasizes the importance of open Internet principles for innovation, and points to state and local requirements for video monitoring to enable the deployment of first responder resources:

> As alarm technology has advanced, a number of cities, including Detroit, Las Vegas, Milwaukee and Salt Lake City, have adopted alarm verification ordinances that require visual verification of an alarm event, either in person or through surveillance video, before emergency services will be dispatched. Other municipalities have enacted policies that prioritize response to alarm signals when accompanied by video or in-person verification. To comply with these ordinances and help ensure the best use of first responder resources for customers, many alarm providers, including ADT, offer surveillance video cameras connected to the overall alarm system that are capable of capturing a video clip, or providing access to live streaming video for a limited time,

[47] Digital Ocean comments, p. 3.
[48] American Association of Community Colleges, American Association of State Colleges and Universities, American Council on Education, Association of American Universities, Association of Public and Land-Grant Universities, Association of Research Libraries, Educause, National Association of College and University Business Officers, and The National Association of Independent Colleges and Universities comments, pp. 12-13.

> when motion is detected. This intermittent, low-volume video can be shared with first responders when requested. Blocking, throttling or de-prioritizing these types of data transmissions could slow emergency assistance, or deny it entirely. The Commission must be aware of, and protect such communications from discrimination or deprioritization.[49]

Akamai offers the perspective of a content delivery network on the importance of enforceable open Internet rules, and stresses the need for a level playing field with ISP-owned content distribution:

> At a minimum, Akamai believes that open Internet principles are key where broadband providers have the greatest economic incentive to engage in harmful conduct. To that end, open Internet protections remain necessary to prevent ISPs from blocking, throttling, or engaging in other discriminatory traffic management practices against third-party content providers, content distributors, or CDNs that compete with the ISP's vertically-integrated content providers, content distributors, or CDNs. Increasingly, through mergers and otherwise, ISPs own content providers and CDNs. The economic incentive for ISPs to give an advantage to owned or vertically-integrated content providers and CDNs, and their unconstrained ability to do so, is obvious.[50]

Etsy discusses the importance of an open Internet for entrepreneurship:

> Etsy would not exist without net neutrality. Founded in 2005 by a furniture maker who was frustrated by the lack of opportunities to sell his wares online, Etsy was built by a few people in a small Brooklyn apartment. Etsy's founders were able to build and launch the website, attract users, and demonstrate the viability of their product with very limited resources. Their early success attracted investors, who felt confident financing the young company in part due to its proven track record on the open market. . . .
>
> In many ways, Etsy's story is not uncommon. There are hundreds of successful internet startups founded by a small group of people in a basement, garage, or coworking space. They harnessed the power of the internet in order to turn a great idea and shoestring budget into a thriving business. These startups were able to compete with bigger, more established companies and build market share precisely because they didn't have to pay cable companies for the privilege of accessing users, or suffer slower load times than an entrenched competitor. Investors continue to support these type of companies because,

[49] ADT comments, p. 4.
[50] Akamai comments, p. 7.

> with a level playing field, they are able to show real products and outcomes from the outset.[51]

Mozilla also emphasizes the impact of open Internet rules on innovation:

> The internet is a powerful tool for the economy and creators. No one owns the internet – we can all create, shape, and benefit from it. And for the future of our society and our economy, we need to keep it that way – open and distributed. This has created an incredible tool and platform that makes all voices free to be heard.
>
> . . .
>
> Net neutrality - that is enforceable and with clear rules for providers - is critical to the future of the internet. Our economy and society depend on it. The 2015 rules protect access to the internet and helped ensure all voices are free to be heard, while preserving the fundamental principles and assumptions on which the internet - and internet policy - have been rooted. To abandon these core assumptions about how the internet works and is regulated would wreak havoc.[52]

Engine, "a non-profit technology policy, research, and advocacy organization that bridges the gap between policymakers and startups" identifies the negative effect on innovation of uncontrolled gatekeeper power:

> While it is impossible to fully calculate the lost innovation and startup activity that would occur if ISPs are allowed to use their gatekeeper power to disadvantage startups, many of the most successful small and medium-sized edge providers operating today have asserted that they likely would not have launched and found success without strong net neutrality rules.[53]

Engine goes on to list the types of start-up companies that would have likely been harmed by non-neutral broadband platforms: Etsy, Tumblr, reddit, General Assembly, LendUp, Distinc.tt, Codecademy, Contextly, Floor64, Badger Maps, FarmLogs, Single, and Kip.[54]

[51] Etsy comments, p. 2.
[52] Mozilla comments, pp. 2 & 7.
[53] Engine comments, p. 15.
[54] Engine comments, pp. 15- 18.

The Entertainment Software Association, which represents video game developers, points to the need for neutral networks, and the potential negative impact of non-neutral networks on the technology produced by its members:

> Fast, reliable, low-latency broadband connections are critical to the game industry and to consumers' enjoyment of the game play experience. To begin with, broadband connectivity is essential for the distribution of games—for several years now, digital downloads of games have surpassed physical sales. To get the benefits of buying and updating games online, players need a broadband connection with adequate bandwidth to support large file downloads in a timely manner. Moreover, the defining feature of video games is that they are interactive—incorporating and reacting to input from end users. Increasingly, video games feature real-time game play with other players in different physical locations and interaction with the game play environment over broadband networks. For these features to work, a consumer's broadband connection must not only be fast and reliable, it must also support low-latency connections with online game services and other players. Severe increases in latency—the amount of time it takes for a particular data packet to move from its origin to its destination on the network—can be frustrating for the gamer and, given the interactive nature of game play, kill the game experience. No one wants to play a game and discover that they've swung too late for a pitch, fired at enemies that are no longer there, or missed a hairpin turn in a racing game.[55]

These edge provider comments support the proposition that there are wide-ranging and substantial economic benefits of network neutrality, as supported by Title II, and implemented by the *2015 Title II Order.* These edge provider comments clearly indicate the benefits of enforceable open Internet rules, such as those supported by the *2015 Title II Order.* While the *2017 NPRM* largely ignored the impact of Title II on investment at the network edge, the outpouring of edge provider comments indicates that the Commission must address the impact of any decision to change the status quo on innovation, investment, creativity, entrepreneurship, and free speech at the network edge.

[55] Entertainment Software Association comments, pp. 3-4.

One group that identifies itself as a representative of edge providers, "ACT | The App Association," appears to misunderstand the *2015 Title II Order*, arguing that the Commission has tried to regulate the network edge.[56] The *2015 Title II Order* was very clear regarding the scope of the open Internet rules, and it is difficult to understand how those rules could be interpreted as targeting the network edge. The App Association also takes issue with the potential for open Internet rules to prevent wireless carriers from offering free data plans.[57] AARP notes, however, that ACT | The App Association is sponsored by Verizon and AT&T, the nation's two largest wireless carriers, parties which have a significant interest in offering free data plans that favor their affiliated content.

## VI. Small ISPs identify the need for, and benefits of, the *2015 Title II Order*

A June 27, 2017 letter to Chairman Pai from 41 small ISPs states that "We have encountered no new additional barriers to investment or deployment as a result of the 2015 decision to reclassify broadband as a telecommunications service and have long supported network neutrality as a core principle for the deployment of networks for the American public to access the Internet."[58]

In a similar spirit, the Home Telephone Company, a small LEC and broadband ISP that operates in South Carolina, states in comments that the *2015 Title II Order* has had no negative impact on its investment decisions, and has been beneficial for its business.

> As a smaller Internet service provider, Home can say that the Title II Order has had no negative impact on our investment decision. In fact, the Title II Order has helped Home to feel more confident in our ability to remain connected to critical Internet backbone networks. (Home also notes that, as small rural carriers know, it prevents large ISPs from using their market power vis a vis edge providers; and thus, doesn't tilt the field in favor

[56] ACT | The App Association comments, pp. 2 & 8.
[57] ACT | The App Association comments, p. 3.
[58] https://ecfsapi.fcc.gov/file/106271543602165/ISP%20letter%20to%20FCC%20on%20NN%2C%20Privacy%2C%20Title%20II.pdf

> of large ISPs—making it even further difficult for small companies to compete.) Home is not alone in the belief that the current Title II rules have not hampered investment.[59]

Home also supports the proposition that major broadband ISPs will exercise market power, should the Title II framework be repealed:

> It should be clear to even the most casual observer that the transport network is a true bottleneck. Left to their own devices (no pun intended), both history and capitalistic principles indicate that these near-monopoly providers will use their bottleneck position to control the process end to end and maximize their profits. One sees signs today of this effort as large companies utilize proprietary set top boxes and other devices to control customer actions. The large networks are also in a buying frenzy gobbling up content providers at an ever-increasing rate. We have already seen large networks giving preferred treatment to their own content, even with existing regulatory rules in place. It takes little imagination to envision what these large unregulated transport providers will do in the future if unrestrained. The Commission must stay in the game as a representative of the people of our nation and act as an impartial referee in the information age.[60]

AARP strongly agrees with Home Telephone Company's conclusions:

> In closing, Home submits that the only way the Commission can ensure a free and open Internet is by remaining in the game as a free and impartial arbiter of the rules of the marketplace. The continuing evolution of the largest networks also becoming the largest content owners demonstrates both the ability and intent to control the information flow. It defies logic and common sense to assume the capital intensive, limited market of Internet access transport will ever be truly competitive. Transport infrastructure is currently, always has been, and likely always will be a utility service—this is dictated by the economics of networks. Given the reality of a bottleneck in the marketplace, the best solution is to ensure that all content and device providers, as well as all end-user customers have access to an open and non-discriminatory broadband transport pipe at a reasonable price. This connection would then allow the operation of a totally competitive content and device market as consumers could use their connections to receive the content they desire using the devices of their choice. Home urges the Commission to support consumers, support small businesses, support rural America, and support vibrant competition among edge providers and device manufacturers to truly keep the Internet free and open.[61]

[59] Home Telephone Company comments, p. 6.
[60] Home Telephone Company comments, p. v.
[61] Home Telephone Company, comments, p. 21.

In summary, the record in this proceeding shows substantial evidence of the benefits of Title II. As illustrated above, some of these benefits are purely economic. Other benefits are social. Still other benefits are political. A diverse group of parties, ranging from individual consumers, elected officials, consumer groups, edge providers, and broadband ISPs all agree that the *2015 Title II Order* has delivered its intended outcome of promoting the virtuous circle, and promoting innovation and investment. The Commission must recognize these substantial benefits and maintain the light-touch regulatory framework supported by the *2015 Title II Order*.

## VII. The economic analyses of broadband ISPs and their supporters do not show harms from Title II or the *2015 Title II Order*

In its discussion of the benefit-cost analysis that the Commission hopes to complete in this proceeding, the *2017 NPRM* places the impact of the *2015 Title II Order* on broadband ISP investment at the top of a very short list of concerns. Other than the impact of Title II on broadband ISP investment, the *2017 NPRM* lists only the prevention of new business models or new products and services as being other potential costs.[62] As discussed above, this overly-narrow focus on broadband ISP investment is inappropriate, and to correctly address investment, the Commission must also address the broad impact of enforceable open Internet rules on consumers and edge providers. Furthermore, the *2015 Title II Order* already gives broadband ISPs the ability to experiment with non-BIAS data services, which can be offered outside of the *2015 Title II Order's* bright-line rules and Internet conduct standard.[63] However, even if the

[62] *2017 NPRM*, ¶113. As discussed by AARP in opening comments, to the extent that broadband ISPs have new "curated" products or services, the *2015 Title II Order's* "non-bias data services" allows broadband ISPs to deliver "curated content" outside of the broadband offering. (AARP comments, pp. 34-36.) To the extent that broadband ISPs have products or services that they want to offer outside of the non-bias data service category, they must compete with edge providers on a level playing field, and not be allowed to give preferential treatment to their affiliated products or services.
[63] *2015 Title II Order*, ¶¶207-213.

Commission continues to maintain the inappropriate perspective that only broadband ISP investment matters, the evidence submitted in this proceeding by broadband ISPs and their supporters does not lend any credence to the theory that the *2015 Title II Order* has imposed any significant costs on broadband ISPs in the form of reduced investment or investment incentives.

AARP's opening comments explained the flaws in the investment studies upon which the *2017 NPRM* relied to support the claim that the *2015 Title II Order* has harmed broadband ISP investment. Other parties also find the *2017 NPRM's* economic foundation to be weak. For example, the Center for Democracy & Technology state:

> First, neither the NPRM nor the studies it relies on show a causal relationship between Title II classification and investment. Second, assuming for the sake of argument the possibility of a correlative relationship between Title II classification and investment, the Open Internet Order has not been in place long enough to produce sufficient evidence of that correlation. Third, the nature of network improvements does not require consistently increased spending to achieve consistent improvements. Without evidence that Title II actually causes a decline in network expansion and improvement, this policy argument for reinstating Title I is unfounded.[64]

AARP agrees with this assessment. On the other hand, the opening comments of the major wireline ISPs all claim that investment has been harmed by the *2015 Title II Order*.[65] AARP finds that these claims are not well supported.

## VIII. Broadband ISP comments do not reasonably address investment

AARP has reviewed the claims of broadband ISPs and their supporters regarding the impact of the *2015 Title II Order* on investment and finds them to be poorly supported. As will be discussed below, none of the broadband ISPs and other parties claiming that investment has been

[64] Center for Democracy & Technology, p. 2.
[65] AT&T comments, p. 53; CenturyLink comments, p. 11; Verizon comments, p. 10; Frontier comments; p. 2; Comcast comments, p. 27; Cox comments, p. 3.

harmed by the *2015 Title II Order* evaluate investment from a public policy perspective, and instead focus solely on broadband ISP investment. These parties frequently rely on the same sources identified in the *2017 NPRM*—the Singer blog post, the *Ford Counterfactual* paper, and the USTelecom research brief.[66] As AARP discussed in detail in opening comments, the Singer, Ford, and USTelecom materials are narrowly focused on broadband ISP investment (as opposed to utilizing a public policy approach, that considers investment in all elements of the Internet ecosystem). Furthermore, even on the matter of broadband ISP investment, the Singer/Ford/USTelecom materials do not provide any convincing evidence that broadband ISP investment has been harmed by Title II.[67]

While many broadband ISPs point to the Singer, Ford, and USTelecom studies, additional studies were also submitted with the comments, and these new studies are no more convincing than the original three referenced in the *2017 NPRM*. In opening comments, AARP advised the Commission regarding general points of evaluation of investment studies,[68] and in the following sections of this reply AARP will apply those points and additional analysis to provide the Commission with an overview of the weaknesses of the new investment arguments submitted in opening comments. In summary, the record contains no evidence that either Title II or the *2015 Title II Order's* light-touch regulatory framework has harmed investment by broadband ISPs.

[66] *2017 NPRM*, ¶¶45-46.
[67] AARP comments, §V, §VI, and Appendix.
[68] AARP comments, pp. 72-73.

## IX. Verizon's consultants show robust broadband investment following the Title II order

To support its comments, Verizon provides an economic analysis penned by Andres Lerner and Janusz Ordover, who are Compass Lexicon consultants.[69] The *Verizon/Compass Lexicon* paper is the most theoretical of the economic studies reviewed by AARP, and its theoretical bent undermines its usefulness when considering the issues raised by the *2017 NPRM.* The *Verizon/Compass Lexicon* paper even extends its theoretical approach to the nature of the *2015 Title II Order's* open Internet rules. Specifically, *Verizon/Compass Lexicon* state that "*In theory*, the FCC also could, under Title II, impose onerous public-utility requirements such as rate regulation."[70] Of course, *in fact*, the FCC exercised substantial forbearance, and onerous public-utility requirements have not been imposed on broadband ISPs. However, much of the discussion in the *Verizon/Compass Lexicon* paper is premised on the assumption that the FCC will impose "onerous public-utility requirements" on broadband ISPs.[71] The fact that the FCC's *2015 Title II Order* exercised substantial forbearance undermines the premise of much of the *Verizon/Compass Lexicon* paper—Title II under the *2015 Title II Order* does not equate to "onerous public-utility requirements."[72]

### A. *Verizon/Compass Lexicon's* theoretical discussion of investment ignores edge providers

Regarding investment, *Verizon/Compass Lexicon* indicate that increased "regulatory uncertainty" stemming from Title II may affect investment decisions.[73] However, *Verizon/Compass Lexicon* do not reasonably consider the impact of increased business risk on investment by edge

[69] Andres V. Lerner and Janusz A. Ordover, "An Economic Analysis of Title II Regulation of Broadband Internet Access Providers," July 17, 2017. Hereinafter *Verizon/Compass Lexicon*
[70] *Verizon/Compass Lexicon*, p. 2.
[71] *Verizon/Compass Lexicon*, pp. 1-2, 3, 7, 9, 11, 13, 14, and 37.
[72] AARP comments, pp. 9-10.
[73] *Id.*

providers, should Title II be repealed. Thus, the *Verizon/Compass Lexicon* paper is subject to the same overly-narrow focus on broadband ISPs that plagues the other economic analysis submitted by carriers in this proceeding.

If the Commission abandons the *2015 Title II Order's* framework, a different set of business actors—edge providers—will face increased business risk, and that business risk will also diminish investment incentives. *Verizon/Compass Lexicon* offer no opinion on the net impact of regulatory uncertainty on business risk by both edge providers and broadband ISPs. Furthermore, as illustrated by the comments of consumers, consumer representatives, and edge providers discussed above, end-users will also face increased risk of higher content costs, and other potential harms, such as stifling edge innovation, interference with the free flow of information, and the stratification of content providers that might arise due to paid prioritization schemes.

Like the other *Compass Lexicon* studies filed in this proceeding,[74] the *Verizon/Compass Lexicon* paper does not consider the impact of FCC rules on investment by all affected stakeholders (which, in turn, affect the diversity and innovation of internet-based services and applications available to consumers and businesses.) Given that *Verizon/Compass Lexicon* gloss over the necessary and corresponding statement regarding the impact of *the absence* of Title II regulation (and enforceable Open Internet rules) on business risk in the balance of the Internet ecosystem, their conclusions that Title II harms "investment"[75] are unreasonable because they reflect a partial and therefore incomplete analysis.

[74] AT&T and CALInnovates filed studies by Compass Lexicon. See below for discussion.
[75] *Verizon/Compass Lexicon,* p. 9, ¶24.

## B. *Verizon/Compass Lexicon* illustrate robust broadband investment under Title II

While *Verizon/Compass Lexicon* is narrowly focused on the impact of Title II on broadband ISPs, the *Verizon/Compass Lexicon* paper offers evidence that robust broadband investment has continued following the *2015 Title II Order*. *Verizon/Compass Lexicon* state:

> The relevant question is whether investment incentives will be lower—*all else equal*—because of regulatory uncertainty from Title II regulation. The risks of regulatory interference do not imply that all investments and innovation will cease—in fact, wireless providers continue to invest in new technologies (such as 5G).[76]

*Verizon/Compass Lexicon* continue:

> Even as deployment of 4G LTE continues, the industry is already investing to further expand the capabilities of wireless broadband networks, including "fifth-generation" ("5G") LTE technology, which will provide higher speeds and reduced latency. *Wireless providers continue to make large investments to roll out new technologies and to make other network improvements. In the six years ending 2015, wireless service providers in the U.S. made capital investments of approximately $177 billion. In 2015 alone, Verizon invested more than $11 billion to meet demands for wireless data and video using 4G LTE, and to lay the groundwork for 5G.*[77]

Thus, the *Verizon/Compass Lexicon* concede that under Title II wireless providers are investing at high levels to roll out 5G.

*Verizon/Compass Lexicon* also illustrate the importance of other countervailing factors that may offset the theoretical muting of investment incentives that may arise from the alleged risks to broadband ISPs under the terms of the *2015 Title II Order.* Most notably, *Verizon/Compass Lexicon* clearly explain the importance of competition in driving broadband ISP investment decisions. *Verizon/Compass Lexicon* note that wireless mobility broadband competition is more robust than is the case for wireline broadband.[78] AARP agrees that relatively speaking, mobility

[76] *Verizon/Compass Lexicon,* pp. 10-11, emphasis in the original.
[77] *Verizon/Compass Lexicon,* p. 19, ¶49, emphasis added.
[78] *Verizon/Compass Lexicon,* p. 16, ¶¶41-42; p. 25, ¶65.

broadband markets experience more competitive activity than fixed broadband markets, given the ability of consumers to choose from four nationwide providers, and in some cases additional smaller regional and local carriers.[79] Furthermore, consumers have benefitted from the presence of the disruptive facilities-based carrier T-Mobile, whose "un-carrier" approach has benefitted customers with lower prices and other market innovations, such as the elimination of contracts.[80] *Verizon/Compass Lexicon* emphasize that competition in the wireless industry has continued to drive investment following the *2015 Title II Order*:

> The *significant investments* and vigorous competition between wireless providers has led to a rapid increase in output of wireless broadband services, both in terms of consumer connections and usage. *For instance, wireless broadband connections have increased by approximately 40 percent between June 2013 and June 2016.*[81]

Thus, *Verizon/Compass Lexicon* find that wireless industry performance under Title II has been impressive. As AARP discussed in opening comments, there are a number of factors that can influence investment,[82] and competition is certainly important when considering investment evidence. The information provided by *Verizon/Compass Lexicon* significantly undermines the *2017 NPRM's* conclusions on investment under Title II.

## C. *Verizon/Compass Lexicon* highlight weak wireline broadband competition

While the *Verizon/Compass Lexicon* paper speaks enthusiastically regarding competition in wireless mobility broadband markets, with regard to competition in the wireline broadband

[79] *Verizon/Compass Lexicon,* p. 16, ¶41.
[80] Commenting on the impact of the proposed merger of AT&T and T-Mobile in 2011, the U.S. Department of Justice noted the competitive impact of T-Mobile: "T-Mobile in particular - a company with a self-described 'challenger brand,' that historically has been a value provider, and that even within the past few months had been developing and deploying 'disruptive pricing' plans - places important competitive pressure on its three larger rivals, particularly in terms of pricing, a critically important aspect of competition. AT&T's elimination of T-Mobile as an independent, low-priced rival would remove a significant competitive force from the market." *United States of America v. AT&T and T-Mobile.* Complaint, August 31, 2011, ¶3.
[81] *Verizon/Compass Lexicon,* p. 25, ¶63.
[82] AARP comments, pp. 51-52.

market *Verizon/Compass Lexicon* offer a more conditional evaluation. *Verizon/Compass Lexicon* explain:

> [b]ecause competitive conditions in the wireline industry vary across geographic areas, and wireline broadband providers compete on a local or regional basis, it is inappropriate to draw conclusions regarding the degree of competition among wireline broadband providers on a national basis.[83]

There is no question that wireline broadband competition is highly dependent on geography, and consumers generally have few choices, as was illustrated in AARP's opening comments.[84] Even in high density urban areas, most consumers face a wireline broadband duopoly, and the overwhelming majority face a broadband monopoly for speeds that exceed the Commission's 25/3 Mbps benchmark.[85]

*Verizon/Compass Lexicon* illustrate how this geographic variation occurs, noting that "Where FiOS is available, there is intense competitive rivalry between Verizon and cable operators in terms of price and quality attributes, and consumers have access to competitive broadband services offering speeds of hundreds of megabits per second."[86] Of course, the vast majority of households in the U.S. do not have access to fiber connections (by year-end 2016 about 30 million homes are passed by fiber in the U.S., i.e., about 24% of all U.S. homes.)[87] Likewise, fiber uptake is limited, only 10.7% of residential broadband connections are fiber based.[88] Thus, most consumers in the U.S. are not benefitting from the rivalry that has benefitted some

[83] *Verizon/Compass Lexicon*¸ p. 25, ¶66.
[84] AARP comments, pp. 73-77.
[85] AARP comments, pp. 73-77.
[86] *Verizon/Compass Lexicon*, p. 26, ¶67.
[87] See, "Fiber Growth Remains Strong: Now Passing 30 Million Homes in the U.S.," October 27, 2016. https://medium.com/@fiberbroadband/fiber-growth-remains-strong-now-passing-30-million-homes-in-the-u-s-5461eb03216b ; https://www.statista.com/statistics/183635/number-of-households-in-the-us/
[88] "Internet Access Services: Status as of June 30, 2016," FCC, Industry Analysis and Technology Division, Wireline Competition Bureau, April 2017, Figure 29.

customers in Verizon's FiOS service areas, and market forces in residential wireline broadband markets continue to be weak.

### D. *Verizon/Compass Lexicon* get "gatekeepers" wrong

This Commission has previously recognized that the key to the success of the open Internet is the lack of "gatekeepers," which leads to "permissionless innovation,"[89] and which promoted an innovation engine unlike any other.[90] This Commission has previously recognized that the Internet's architecture "enables innovators to create and offer new applications and services without needing approval from any controlling entity, be it a network provider, equipment manufacturer, industry body, or government agency."[91] Furthermore, as noted in the *2015 Title II Order*:

> Although there is some disagreement among commenters, the record provides substantial evidence that broadband providers have significant bargaining power in negotiations with edge providers and intermediaries that depend on access to their networks because of their ability to control the flow of traffic into and on their networks. Another way to describe this significant bargaining power is in terms of a broadband provider's position as gatekeeper—that is, regardless of the competition in the local market for broadband Internet access, once a consumer chooses a broadband provider, that provider has a monopoly on access to the subscriber.[92]

*Verizon/Compass Lexicon* dispute this perspective and state that gatekeeper power is not present in broadband markets.[93] *Verizon/Compass Lexicon* argue that the threat of an edge provider passing on the costs that it incurs due to broadband ISP discrimination will lead to incentives for broadband ISPs to refrain from discrimination.[94] Speculating that a company like Netflix would

[89] *2010 Open Internet Order*, ¶3.
[90] *2015 Title II Order*, ¶83.
[91] *In the Matter of Preserving the Open Internet, Broadband Industry Practices*, GN Docket No. 09-191, WC Docket No. 07-52, Report and Order, December 23, 2010, ¶13, citations omitted, emphasis added.
[92] *2015 Title II Order*, ¶80.
[93] *Verizon/Compass Lexicon*, pp. 29-30.
[94] *Verizon/Compass Lexicon*, pp. 35-36.

simply pass on to customers any discriminatory fees imposed by a broadband ISP, and that that pass-through would then lead to the broadband ISP losing customers, *Verizon/Compass Lexicon* conclude:

> The loss of subscribers would impose significant costs on broadband providers, and this loss provides a powerful competitive constraint in the incentive and ability of providers to impose anticompetitive arrangements vis-à-vis content providers.[95]

*Verizon/Compass Lexicon* argue that the threat of losing broadband customers from blocking or discrimination against edge providers prevents broadband ISPs from acting as gatekeepers.[96] As will be discussed below in more detail, the prospect of consumers dropping broadband service in response to ISP mischief is very small, precisely due to the lack of consumer choice in broadband markets.

Ignoring for the moment that Verizon was not constrained by the fear of losing broadband customers when it refused to upgrade Netflix interconnection ports, ultimately forcing Netflix to pay Verizon additional fees to deliver traffic to Netflix's customers,[97] the *Verizon/Compass Lexicon* paper's theoretical proposition fails to acknowledge key factors that undermine the "customer loss will deter broadband ISP mischief" argument.

First, the *Verizon/Compass Lexicon* paper assumes that consumers can easily switch to another broadband provider. Given the prevalence of monopoly and duopoly conditions in broadband markets, easy switching is not a possibility for many customers, especially those who want high-

[95] *Verizon/Compass Lexicon,* pp. 35-36, ¶88.
[96] *Verizon/Compass Lexicon*¸ p. 36, ¶89.
[97] See, for example, "Netflix partner says Verizon slows traffic," *CNN*, July 18, 2014. http://money.cnn.com/2014/07/18/technology/netflix-verizon/index.html ; see also, Petition to Deny of Netflix, Inc. *In the Matter of Applications of Comcast Corp. and Time Warner Cable Inc. for Consent to Transfer Control of Licenses and Authorizations*, MB Docket No. 14-57, August 25, 2014, pp. 43-46.

speed broadband, such as that available from cable companies, but which is not available from DSL providers.

Second, while not using the terminology, the *Verizon/Compass Lexicon* story is a variation of the "internalization of complementary efficiencies" argument ("ICE").[98] Under the ICE theory, a broadband platform provider will recognize the efficiencies that it gains from encouraging providers of complements (such as over-the-top video) on its broadband platform. In theory, the providers of complements to the broadband platform generate benefits for the broadband platform owner (in the form of higher demand for the broadband platform), and those benefits discourage discrimination and blocking of the third-party content—if the platform owner prevents end users from accessing the content and services of their choice, the value of the platform is reduced.

However, the ICE theory breaks down when the platform owner produces its own versions of the complementary services, and thus faces competition from the third-party providers for its own complementary services. Under those circumstances, the internalization of complementary efficiencies is outweighed by the broadband ISP's desire to increase the profitability of its own offerings, e.g., its own video programming.[99] This exception to the ICE theory is a growing phenomenon. As discussed in AARP's opening comments, broadband ISPs are branching out into an increasing variety of "complementary" service areas, such as home automation, alarm

[98] See, for example, Jonathan Nuechterlein and Philip Weiser, *Digital Crossroads*, 2nd ed., MIT Press, 2013, pp. 221-224.
[99] See, Joseph Farrell & Philip J. Weiser, "Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age," *Harvard Journal of Law & Technology*, Volume 17, Number 1 Fall 2003, pp. 109-112. http://jolt.law.harvard.edu/articles/pdf/v17/17HarvJLTech085.pdf

services, medical monitoring, smart grid, and Internet of Things.[100] As a result, broadband ISPs face growing incentives to protect their own profit streams from over-the-top competition.

*Verizon/Compass Lexicon's* argument that edge providers can easily pass the costs of discrimination imposed by broadband ISPs onto their customers is also flawed. Using the *Verizon/Compass Lexicon* Netflix example, when a broadband ISP also provides video programming, interfering with Netflix traffic would result in the broadband ISP gaining a competitive advantage for its own video programming, as its video offerings would not be subject to the discrimination. Thus, Netflix *could not* raise its prices if it experiences discrimination, as Netflix would risk losing its customers to video offerings of the broadband ISP. In summary, both due to the difficulty that consumers have when switching broadband providers (especially wireline broadband providers), and due to the growing conflict of interest that broadband ISPs experience because of their expansion into the provision of complementary services that compete with the edge, the *Verizon/Compass Lexicon* paper's claims that market forces protect consumers and edge providers are not reasonably supported.

## E. *Verizon/Compass Lexicon* misunderstand *ex ante* competition and gatekeepers

The *Verizon/Compass Lexicon* paper also raises the issue of *ex ante* competition to support its claim that market forces already offer consumers and edge providers protection from "gatekeepers":

> The "gatekeeper" claim motivating the Title II Order incorrectly dismisses . . . competition for subscribers, and instead argues that "once a consumer chooses a broadband provider," the provider is a monopolist over that subscriber. But this *ex post* view of competition ignores the *ex ante* competition to sign up customers in the first place. By the same token, a movie theater, theme park, or stadium could be maintained to be a "gatekeeper" monopolist over customers who have entered the venue, and therefore could take advantage of those customers (as well as any suppliers wishing to serve those

[100] AARP comments, p. 20.

> customers, such as soft-drink suppliers). But this would ignore the competition to attract customers to the venue in the first place.[101]

Thus, *Verizon/Compass Lexicon* argue that "*ex ante*" competition, the competition for a consumer prior to choosing a broadband provider, or prior to a consumer entering a venue like a movie theater, theme park, or stadium, protects consumers from exploitation after the choice is made. *Verizon/Compass Lexicon* argue that these businesses do not have the ability to change above-market rates once consumers have passed through the gate into the "venue" because the *ex ante* competition prevents that exploitative behavior.

On the matter of competition and gatekeepers, the theoretical predictions of *Verizon/Compass Lexicon* do not jibe with market reality. For example, as anyone who has been to a movie theater, theme park, or stadium knows, once inside the venue, the power of a gatekeeper is clearly visible. The $5 price for a bottle of water at the ballpark or concert reflects the impact of a gatekeeper's market power, and even non-economists are likely to have noticed that outside of the stadium, numerous competing vendors manage to deliver a bottle of water for $1. Something about passing through the stadium gate causes prices to rise dramatically, and *Verizon/Compass Lexicon* deny this market reality. The *ex ante* competition theory is not consistent with reality, either at the ballpark, or with regard to a consumer's broadband ISP connection. Once a consumer has selected their broadband provider, the consumer faces limited choices and switching costs,[102] and these market imperfections then enable broadband ISPs to exploit the edge providers that must utilize the broadband gatekeeper's facilities to reach their customers (and to exploit the end-user as well).

[101] *Verizon/Compass Lexicon*¸ p. 30, ¶75.
[102] *2015 Title II Order*, ¶81.

## F. *Verizon/Compass Lexicon* get multi-homing wrong

In opening comments, AARP discussed the impact of the terminating access monopoly controlled by broadband ISPs.[103] Because consumers cannot easily "multi-home" (i.e., maintain multiple broadband connections with similar technical characteristics), edge providers have no choice but to deal with their end-users' broadband ISPs, who become gatekeepers. This leads to the potential for broadband ISPs to harm edge providers and edge innovation.[104]

*Verizon/Compass Lexicon* assert that customers *do* engage in multi-homing, and also claim that customer multi-homing is a mechanism that eliminates gatekeeper power.[105] On the matter of multi-homing, *Verizon/Compass Lexicon* offer an unusual perspective on competition and consumer choice. *Verizon/Compass Lexicon* argue that edge providers who are subject to discrimination by broadband ISPs can simply encourage their customers to switch providers.[106] Such behavior by an edge provider would appear to be very impractical for several reasons.

For example, suppose that Verizon FiOS were to engage in discriminatory behavior that resulted in Netflix customers experiencing degraded service. *Verizon/Compass Lexicon's* solution would be for Netflix to tell its customers who use Verizon FiOS to "switch to AT&T U-verse, which has not imposed these restrictions on our traffic." Of course, because Verizon and AT&T do not compete against one another in wireline broadband markets, such a choice is impossible. Given the geographic variation in competition that *Verizon/Compass Lexicon* elsewhere acknowledge,[107] consumers' ability to switch to a broadband ISP that did not block or throttle the content of their choice is limited.

[103] AARP comments, pp. 78-80.
[104] 2010 Open Internet Order, ¶24. See also, AARP comments, pp. 5-6.
[105] *Verizon/Compass Lexicon*, pp. 7 & 36.
[106] *Verizon/Compass Lexicon*¸ p. 31, ¶78.
[107] *Verizon/Compass Lexicon*, p. 25, ¶66.

Furthermore, the *Verizon/Compass Lexicon* "simply switch provider" argument has additional limitations should more than one edge provider face discrimination from various broadband ISPs. For example, if Verizon discriminated against Netflix, but Comcast did not; while at the same time Comcast discriminated against YouTube, while Verizon did not, the following (confusing) message from the two affected edge providers, directed at the same end-user would result:

> "If you want Netflix, subscribe to Comcast, and if you want YouTube, don't subscribe to Comcast."

The *Verizon/Compass Lexicon* multi-homing and choice argument is not reasonable.

Furthermore, when explaining consumers' options for multi-homing, it is clear that *Verizon/Compass Lexicon* have not reasonably considered consumer behavior.

> . . .consumers generally do multi-home by accessing online content and services on multiple platforms, such as one or more wireless broadband services, a wireline broadband service at home, a wireline broadband service at work, and Wi-Fi networks at numerous locations (e.g., Starbucks, libraries, airports).[108]

While it is certain that many consumers utilize different sources of broadband Internet access, it is not reasonable to assume that consumers can easily switch between these options, or would want to. For example, if Verizon throttles Netflix as a Netflix customer is sitting down to enjoy an episode of *House of Cards* on their Internet-connected big-screen television, *Verizon/Compass Lexicon* apparently believe that the consumer will be indifferent to watching the program on the big screen in the comfort of their home, or watching the program at work the next day on their work PC; or would be indifferent to driving over to the airport or the Starbucks and using the public Wi-Fi to watch on their laptop; or burning through their data allowance to

[108] *Verizon/Compass Lexicon*, p. 36, ¶91.

watch on their cell phone. Certainly, customers would find those options to be highly inconvenient, and as was the case with *ex ante* competition protecting the price of water at the ball park or broadband customers, *Verizon/Compass Lexicon* appear to be disconnected from the nature of the choices facing broadband customers. As noted in the comments of ordinary citizens in this proceeding cited above, market choices are limited. Here are a few other consumer observations:

> In addition, please keep in mind that I have very little choice in which ISP to choose from. Where I live, there is only one ISP that provides service. My choice of patronage is already limited in how I gain access to the internet, net neutrality rules have a strong potential to also make it so that the quality of the internet I have access to depends on a company I have no choice in using.[109]

> My view of the internet does not see competitiveness in the market available to me. I live in San Jose, part of the Silicon Valley, and despite this, I have little choice in my broadband provider. There is one DSL provider in my area and speeds of 6 mbps are insufficient for my household. It is not uncommon for 2 separate video streams to be running, while an internet video game is being played, and a video/audio product is being uploaded. I only have 1 ISP that can fulfill my modern broadband needs with a minimum of 10 mbps. That is not competition. The Title 1 Reclassification of broadband that occurred around the turn of century was supposed to improve competition and speed. Competition has drastically reduced since that time. There is no objective evidence I have seen supporting the position that Title I would increase competition.[110]

> The national broadband market may appear to be healthy with lots of providers and plenty of competition. At the local level, it is a much different picture. There are only two local providers, Cox & Centurylink. I've tried both. The only competition they have is who can offer the poorest service at the highest cost. Even though the speed is advertised at 25Mbps down and 3 Mbps up, I never see anything close to those speeds.[111]

[109] Comments of John R. Graham, p. 1.
[110] Comments of James Burkhardt.
[111] Comments of Nick Mancini.

In summary, the *Verizon/Compass Lexicon* paper provides no evidence that Title II has had a negative impact on broadband investment, and instead supports the proposition that broadband investment has been robust following the *2015 Title II Order*. The paper is highly theoretical, and divorced from both the economic reality of little competition in wireline broadband markets and the growing conflict of interest that broadband ISPs face due to their provision of an increasing number of complementary services that compete with edge providers. Verizon relies on the *Verizon/Compass Lexicon* paper to support the proposition that the costs of Title II exceed the benefits.[112] As a result, Verizon's economic arguments are not credible.

## X. AT&T's consultants show that Title II and broadband investment are compatible

AT&T provides a declaration from three Compass Lexicon consultants: Mark Israel, Allan Shampine, and Thomas Stemwedel (hereinafter *AT&T/Compass Lexicon*). On the matter of investment, *AT&T/Compass Lexicon* do not conduct their own study, but instead reference the work of others. *AT&T/Compass Lexicon* claim that Title II has reduced investment incentives, and also claim that this is confirmed by empirical evidence.[113] One element of the empirical evidence used by *AT&T/Compass Lexicon* regarding allegedly lower investment is a 2017 article by Thomas Hazlett and Joshua Wright.[114] It is important to note, however, that the *Hazlett/Wright* paper does not focus on investment following the *2015 Title II Order*. Rather,

[112] Verizon comments, pp. 10-11, 13, 34.
[113] *AT&T/Compass Lexicon*, p. 54.
[114] *AT&T/Compass Lexicon*¸ p. 54, citing to Thomas Hazlett & Joshua D. Wright, "The Effect of Regulation on Broadband Markets: Evaluating the Empirical Evidence in the FCC's 2015'Open Internet' Order," 50 *Review of Industrial Organization* (2017) 487-507. Hereinafter, *Hazlett/Wright.*

the *Hazlett/Wright* paper evaluates the investment analysis contained in the *2015 Title II Order.*[115]

In the *2015 Title II Order,* the FCC cited to US Telecom data that showed that broadband providers invested $212 billion during the three years following the *2010 Open Internet Order,* 2011-2013. The FCC pointed out that this was the highest level of investment since 2002.[116] Regarding the 2011-2013 period, *Hazlett/Wright* take issue with the FCC's methods, and conclude that the FCC erred by failing to adjust investment values for GDP inflation.[117] With the GDP adjustment, *Hazlett/Wright* state that investment during the 2011-2013 period was lower following the *2010 Open Internet Order*. Because this is a period when Title I was still in place, other than pointing out that the inflation-adjusted number is lower, the investment level has little to do with Title II. *Hazlett/Wright* conclude that in the 2011-2013 period had lower investment than 12 of the 16 data points that they study.[118] However, what is clear from the *Hazlett/Wright* paper is that 7 of the 12 periods where investment was higher than 2011-2013 were when Title II regulation was in effect. In other words, even when USTelecom investment values are adjusted for GDP inflation, higher levels of investment are observed when Title II regulation is in effect. Figure 1 below is reproduced from the *Hazlett/Wright* article.[119]

[115] "This paper evaluates the FCC's empirical arguments and finds them uncompelling. Adjustments for inflation or general economic trends eliminate the effects cited by the FCC." *Hazlett/Wright*, p. 487.
[116] *Hazlett/Wright*, p. 492, citing to *2015 Title II Order*, ¶2.
[117] Thomas Hazlett & Joshua D. Wright, "The Effect of Regulation on Broadband Markets: Evaluating the Empirical Evidence in the FCC's 2015'Open Internet' Order," 50 *Review of Industrial Organization* (2017) 493.
[118] *Hazlett/Wright* utilize a three-year rolling average when they examine investment values.
[119] *Id.* The illustrative markings showing the Title II transition period and the Title I and Title II timeline have been added to the original *Hazlett/Wright* bar graph. Because *Hazlett/Wright* utilize a three-year rolling average, the 2005 Title II/Title I demarcation is spread over three of the bars, i.e., three periods include the watershed 2005 year.

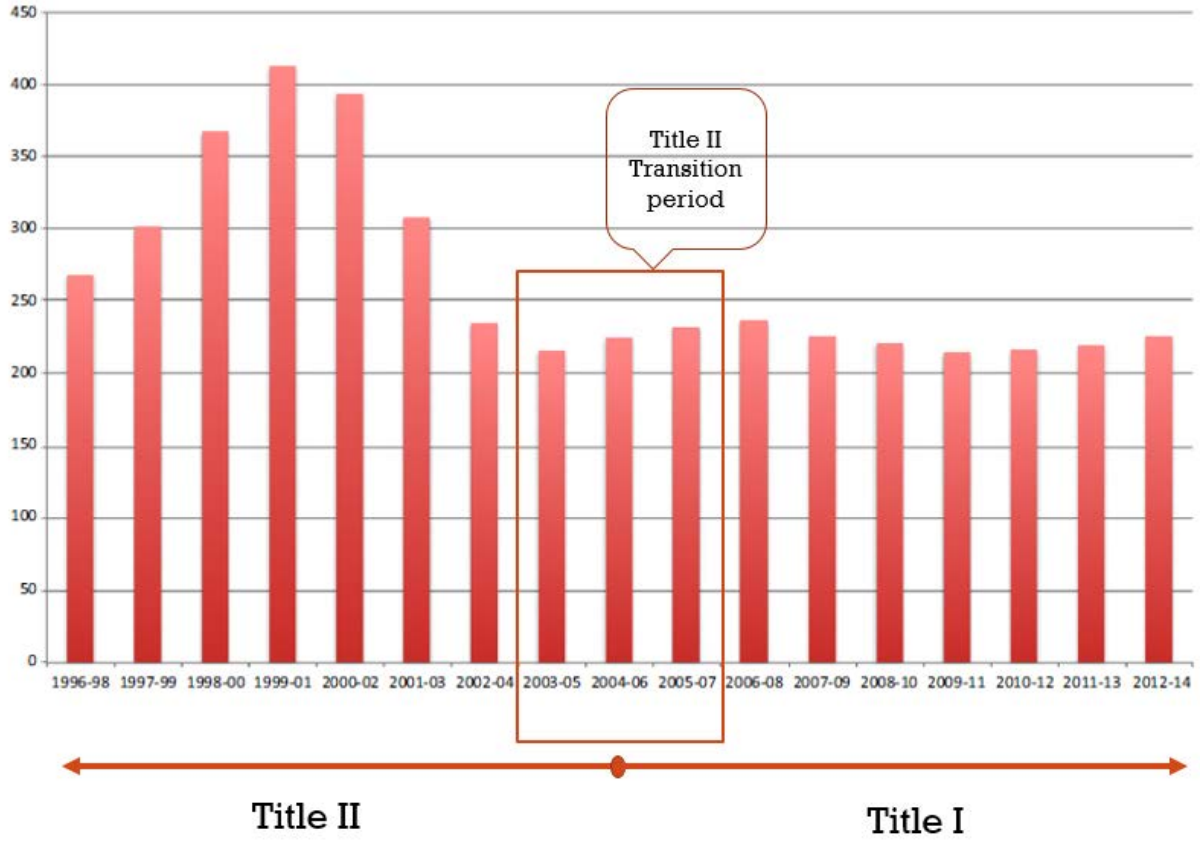


**Figure 1: 3-Year rolling average broadband capex (billions of 2014 dollars).**

Other than the fact that the *Hazlett/Wright* approach adjusts for inflation and utilizes a three-year rolling average, the data from *Hazlett/Wright* looks very similar to the USTelecom data discussed above. However, because *Hazlett/Wright* adjusts the investment values for inflation, their illustration of the high levels of investment under Title II are even more compelling. The *Hazlett/Wright* paper clearly shows that the highest level of inflation adjusted broadband capital expenditures ("capex") in their study period occurred during the Title II period. As a result, the *AT&T/Compass Lexicon* claims regarding Title II and investment based on the *Hazlett/Wright* article do not hold up.

*AT&T/Compass Lexicon* also point to the USTelecom research brief that AARP discussed in detail in opening comments, which also overlooks the strong capex performance under Title II.[120]

*AT&T/Compass Lexicon* also rely on an October 2016 white paper from the Progressive Policy Institute that claims that there "was a net decrease in domestic capital spending in 2015" due to the *2015 Open Internet Order*.[121] A review of the Progressive Policy Institute paper, however, shows that it makes an unsupported assertion that regulation was the sole cause of the alleged decline in capital spending, and considers no other factors that might influence investment.[122] Thus, like the Singer blog post that AARP discussed in opening comments, the Progressive Policy Institute also relies on faulty *post hoc* reasoning. As AARP explained in opening comments, there are a variety of factors that influence investment decisions, and ignoring those other factors leads to a distorted conclusion.[123]

AT&T's opening comments rely exclusively on the *AT&T/Compass Lexicon* declaration in support of its claims that the *2015 Title II Order* had a negative impact on investment.[124] However, even AT&T admits that "correlation does not equal causation, and . . . it may be impossible to isolate all confounding variables."[125] In other words, *post hoc* reasoning and ignoring the other factors that may influence investment decisions, such as technological change or the timing of investment projects, is the best that AT&T has to offer. AT&T provides no

[120] AARP comments, pp. 57-61.
[121] *AT&T/Compass Lexicon*, p. 55, citing to Michelle Di Ionno & Michael Mandel, "Investment Heroes 2016," Progressive Policy Institute, October 2016, p. 6.
[122] Michelle Di Ionno & Michael Mandel, "Investment Heroes 2016," Progressive Policy Institute, October 2016, *passim.* CALInnovates also points to the "Investment Heroes 2016" report to support the proposition that broadband ISP investment has declined. CALInnovates comments, p. 4.
[123] AARP comments, pp. 51-54.
[124] AT&T comments, pp. 53-55.
[125] AT&T comments, p. 54.

support for the proposition that broadband investment has declined following the *2015 Title II Order,* or has ever been harmed by Title II.

## A. *AT&T/Compass Lexicon* are wrong about broadband competition

*AT&T/Compass Lexicon* argue that there is intense competition in fixed and mobile broadband markets.[126] As noted above in this reply, *Verizon/Compass Lexicon* disagree with this assessment, and point to differences in competition in wireless and wireline markets, and differences in competition that exist on a regional basis within wireline broadband markets.[127] *AT&T/Compass Lexicon* do admit, however, that many consumers face duopoly wireline broadband markets.[128] *AT&T/Compass Lexicon* do not find this to be a problem, and argue that "Economics teaches that in markets such as broadband Internet access, the presence of two competitors is likely to result in effective competition."[129] This is not a reasonable assessment of wireline broadband markets. If two competitors generate effective competition, then *AT&T/Compass Lexicon* must explain why the introduction of a "disruptive" facilities-based wireline competitor has been consistently observed to elicit dramatic price reductions and quality improvements in wireline duopoly markets.

There is evidence that disruptive entry undermines the live-and-let-live environment in broadband duopolies where price competition is tepid, and the two incumbent firms in the

[126] *AT&T/Compass Lexicon*, pp. 12-27.
[127] *Verizon/Compass Lexicon,* p. 25, ¶¶65-66.
[128] *AT&T/Compass Lexicon*, p. 24. There, *AT&T/Compass Lexicon* point to FCC data that *AT&T/Compass Lexicon* claims shows that "97% of developed census blocks had at least two providers offering fixed 10 Mbps or greater Internet service, and 79% of the blocks had at least three providers." However, *AT&T/Compass Lexicon* overlook the fact that the FCC data includes satellite providers in that statistic, and satellite providers offer services that are substantially more expensive than wireline broadband, thus making them much less attractive to customers in areas where wireline broadband providers are present. The low subscription rates for satellite services clearly indicate their limited substitutability for wireline broadband, with the most recent FCC data showing just 2 million satellite broadband subscribers, out of 104 million fixed broadband subscribers. See, "Internet Access Services: Status as of June 30, 2016," FCC, Industry Analysis and Technology Division, Wireline Competition Bureau, April 2017, Figure 28.
[129] *AT&T/Compass Lexicon*, p. 28.

market do not undercut one another's pricing practices. Before turning to those specifics, a few more words about disruptive competitors. It is quite common for firms in highly concentrated industries to engage in tacit collusion or other price fixing activities.[130] A market with a small number of service providers may perform just as poorly as a monopoly with regard to pricing and investment. However, the presence of a disruptive "maverick" firm may result in an improved market outcome. For example, when evaluating a merger, the U.S. Department of Justice considers how firms in the market behave:

> The Agencies consider whether a merger may lessen competition by eliminating a "maverick" firm, i.e., a firm that plays a disruptive role in the market to the benefit of customers. For example, if one of the merging firms has a strong incumbency position and the other merging firm threatens to disrupt market conditions with a new technology or business model, their merger can involve the loss of actual or potential competition. Likewise, one of the merging firms may have the incentive to take the lead in price cutting or other competitive conduct or to resist increases in industry prices. A firm that may discipline prices based on its ability and incentive to expand production rapidly using available capacity also can be a maverick, as can a firm that has often resisted otherwise prevailing industry norms to cooperate on price setting or other terms of competition.[131]

Where Google Fiber has entered broadband markets, it has had a disruptive impact on the cozy relationship that has developed between ILECs and cable companies, thus providing a "natural experiment" to test the *AT&T/Compass Lexicon* hypothesis that existing duopoly markets are "highly competitive." Google's approach deployed fiber to the customer's premise, and provided an increase in facilities-based competition.[132] However, rather than looking to existing

[130] See, for example, Carlton, D. and Perloff, J. *Modern Industrial Organization*, Pearson, 2005, p. 135. See also, Maille, P., Naldi, M., and Tuffin, B. "Understanding and Preventing Tacit Collusion among Telecommunication Operators," in *Network Control and Optimization*, Núñez-Queija, R, and Resing, J. Eds, Spring, 2009.
[131] U.S. Department of Justice, *Horizontal Merger Guidelines*, 2010, pp. 3-4. http://www.justice.gov/sites/default/files/atr/legacy/2010/08/19/hmg-2010.pdf
[132] It appears that Google Fiber has pulled back from new fiber deployments. Google indicates that it is considering alternative delivery mechanisms (https://fiber.googleblog.com/2016/10/advancing-our-amazing-bet.html). Press reports indicate that the motivation for Google's decision included pressure from Google's parent Alphabet. "Google Fiber division cuts staff by 9%, 'pauses' fiber plans in 11 cities," *ARSTechnica*, October 25, 2016. https://arstechnica.com/information-technology/2016/10/google-fiber-laying-off-9-of-staff-will-pause-plans-for-10-cities/

market prices to derive its price points, Google offers service choices that include a 1 gigabit (symmetric upload and download) speed for $70 per month. Comparing this to, for example, a Spectrum basic offering of 60 Mbps at $45 per month, or a AT&T DSL offering of 18 Mbps at $40 per month shows the disruption. Google's service, on a per-Mbps basis, is $0.07. Spectrum's price is $0.75 per Mbps, AT&T's price is $2.22 per Mbps.

AT&T's responses to Google fiber entry are notable. AT&T has expanded its "AT&T Fiber"[133] offerings in cities where Google has either begun, or announced its intention to offer service.[134] However, what is most notable is AT&T's pricing for its AT&T Fiber service in cities where Google has actually begun operations. Where AT&T directly competes with Google, or believes that Google will soon be entering, AT&T has dropped the price of its AT&T Fiber service by $40 per month—from $110 to $70.[135] For example, in Kansas City, AT&T announced a $70 price point for its fiber-based AT&T Fiber service.[136] Likewise, in Charlotte, North Carolina, another market where Google has a presence, AT&T has announced AT&T Fiber service at $70 per month.[137] Identical behavior was observed in Nashville, following the announcement that Google would expand its fiber network in that city—AT&T announced a drop in its fiber-based

[133] AT&T recently changed the name of its fiber-based offerings from "GigaPower" to "AT&T Fiber."
[134] See, for example, "Where in San Antonio is AT&T's GigaPower Actually Available?" *San Antonio Current*, September 15, 2015. http://www.sacurrent.com/Blogs/archives/2015/09/30/where-in-san-antonio-is-atandts-gigapower-actually-available. See also, http://www.olatheks.org/government/public-works/construction-projects/google-fiber-and-at-t-construction ; see also, http://arstechnica.com/business/2015/11/att-expands-gigabit-fiber-to-23-cities-starting-at-70-or-110/
[135] "AT&T expands gigabit fiber to 23 cities starting at $70 (or $100)." *Ars Technica*, November 10, 2015. http://arstechnica.com/business/2015/11/att-expands-gigabit-fiber-to-23-cities-starting-at-70-or-110/ . See also, "Google Fiber competition makes AT&T cut cost of gigabit service in some areas," *PC World*, October 5, 2015. http://www.pcworld.com/article/2989109/networking-hardware/google-fiber-competition-makes-att-cut-cost-of-gigabit-service-in-some-areas.html
[136] "AT&T to match Google Fiber speeds, prices in Kansas City and suburbs." *The Kansas City Star*, February 15, 2015. http://www.kansascity.com/news/business/technology/article10441850.html
[137] U-verse with AT&T GigaPower Launches Today in Charlotte and Surrounding Areas, AT&T Press Release, June 15, 2015. http://about.att.com/story/uverse_with_gigapower_launches_in_charlotte_area.html

AT&T Fiber service of 40%.[138] This behavior is not limited to AT&T, as cable companies have been similarly disrupted by competition from Google Fiber. In Atlanta, both AT&T and Comcast have dropped prices and increased investment in light of a Google Fiber announcement that it will enter the market.[139] Elsewhere, Comcast also has dropped prices to Google's levels of $70 per month.[140] Alternatively, when Time Warner Cable learned that Google Fiber was exploring expanding service to Charlotte and Raleigh, Time Warner announced "TWC Maxx," which will increase speeds for customers six-fold, *at no additional charge.*[141] A more clear illustration of the consequences of broadband market power is hard to find. AT&T charges customers who do not have the competitive choice of Google Fiber prices that are 36% higher. Time Warner drops per-Mbps-prices by a factor of six.

This evidence contradicts the *AT&T/Compass Lexicon* assertion that wireline broadband markets are highly competitive. Rather, what the evidence shows is that unless a disruptive competitor enters the market, a cozy duopoly in wireline broadband exists—prices are kept artificially high.

As discussed above, the comments provide numerous examples of the lack of consumer choice in broadband markets. In opening comments, AARP provided the results of a study prepared by Trevor R. Roycroft, Ph.D. that examined broadband choice in California. The California Public Utilities Commission acknowledges that the study shows a lack of broadband choice in

[138] "AT&T drops fiber prices to Google Fiber levels," *The Tennessean*, September 29, 2015. http://www.tennessean.com/story/money/2015/09/29/t-drops-fiber-prices-google-fiber-levels/73023434/
[139] Google Gets Beaten to the Punch by AT&T on Super-Fast Broadband, *Chicago Tribune*, April 25, 2016. http://www.chicagotribune.com/bluesky/technology/ct-att-super-fast-broadband-20160425-story.html
[140] "Comcast is afraid of Google Fiber, because Comcast is afraid of competition," *The Verge*, March 17, 2016. http://www.theverge.com/2016/3/17/11256318/comcast-is-afraid-of-google-fiber
[141] Time Warner Press Release, March 5, 2015. http://www.timewarnercable.com/en/about-us/press/twc-to-transform-internet-tv-experience-triangle.html

California.[142] Comments filed by Floor64, Inc./Techdirt.com/Copia Institute provide direct evidence from the consumer level on the lack of choice in California:

> Similarly, despite living in the heart of Silicon Valley at the time we incorporated in early 2001, I was completely unable to get broadband access for many years, managing the entire site through either a dial up or an incredibly slow wireless modem. Even today, still living in the heart of Silicon Valley, I have only one true broadband option, and it's with a company I would prefer not to do business with.[143]

On the matter of competition, the Attorneys General of the States of Illinois, California, Connecticut, Hawaii, Iowa, Maine, Maryland, Massachusetts, Mississippi, Oregon, Vermont, Washington, and the District of Columbia[144] state:

> While consumers increasingly rely on their broadband service or smart phone to replace the functions of traditional cable television and telephone service, market consolidation has resulted in both fewer and larger ISPs, giving a small number of providers large control over the market. Even in the areas of the country with more than one broadband competitor, long-term contracts and installation fees make it difficult to switch providers. Competition therefore provides an inadequate check against abusive practices.[145]

In summary, wireline broadband competition is weak, and *AT&T/Compass Lexicon* do not offer any convincing evidence to the contrary. Weak competition in wireline broadband markets means that consumers and edge providers are placed at risk in the absence of enforceable open Internet rules.

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[142] The same study was filed by AARP in the ongoing FCC technology transition docket. For the CPUC's statement, see, Reply Comments of the California Public Utilities Commission, *In the Matter of Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment, In the Matter of Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, WC Docket No. 17-84, WT Docket No. July 17, 2017, p. 13. https://ecfsapi.fcc.gov/file/107171256329404/WC%2017-84%20and%20WT%2017-79%20CPUC%20Reply%20comments%20to%20Wireline%20and%20Wireless%20Deployment%20NPRMS.pdf

[143] Floor64, Inc./Techdirt.com/Copia Institute comments, 2nd unnumbered page.

[144] Hereinafter *Thirteen Attorneys General.*

[145] *Thirteen Attorneys General*, p. 18.

### B. *AT&T/Compass Lexicon* miss most of the mark on gatekeepers

Like *Verizon/Compass Lexicon, AT&T/Compass Lexicon* argue that terminating access monopoly (or gatekeeper power) is not a concern. The discussion provided above in the *Verizon/Compass Lexicon* section on gatekeeper power applies equally to the *AT&T/Compass Lexicon* arguments. However, *AT&T/Compass Lexicon* concede that gatekeeper power is possible, and *AT&T/Compass Lexicon* also deliver advice on what to do when it is present. *AT&T/Compass Lexicon* state: "to the extent there were any legitimate concerns about broadband providers having a 'terminating access monopoly,' those concerns would be fully addressed by prohibitions on unjustified blocking and throttling, coupled with transparency requirements."[146] AARP agrees that prohibitions on blocking and throttling are needed, as well as transparency requirements. Title II is the only way to ensure that the blocking and throttling requirements are enforceable.

## XI. CenturyLink, Charter, Cox, and Frontier rehash unreliable sources on Title II and investment

### A. CenturyLink on investment—the Horney blog post suffers from *post hoc* reasoning

Like the other broadband ISPs, CenturyLink claims that the *2015 Title II Order* has harmed investment.[147] To support this claim, CenturyLink points to sources that AARP addressed in opening comments, including the Hal Singer blog post and the USTelecom research brief.[148] CenturyLink also points to two documents produced by the Free State Foundation.[149] The first of these Free State sources is a blog post by Michael Horney. The Horney blog post points to a downward tick in a trend line that he projects, based on raw investment numbers from

[146] *AT&T/Compass Lexicon*, p. 36.
[147] CenturyLink comments, pp. 11-14.
[148] See, AARP comments, pp. 47-60.
[149] CenturyLink comments, p. 11, footnote 28, and p. 12, footnote 29.

USTelecom.[150] Thus, the Horney blog post ignores the impact of numerous factors that may influence investment decisions, such as those discussed by AARP in opening comments,[151] and his argument is subject to the same *post hoc* reasoning as the original Singer blog post. Furthermore, the Horney blog post admits that its conclusions are not informative. Horney states that his work: "is not a regression analysis, so I cannot say by how much the regulatory uncertainty and costs imposed in the Open Internet Order negatively impacted broadband investment."[152] However, that caveat is missing from the lead paragraphs of the Horney blog, which claim that broadband investment fell by $5.6 billion because of the *2015 Title II Order.*[153] The Horney blog post does not support the proposition that Title II has harmed investment.

The second Free State piece cited by CenturyLink is a general discussion of alleged harms to investment by a variety of regulations in the telecom sector, including the *2015 Title II Order.* [154] However, this paper (by Theodore Bolema) relies directly on the Singer blog post to support the proposition that Title II is harming investment incentives for broadband ISPs. As additional "proof," Bolema cites to other Free State documents, that also cite to the Singer blog post.[155] The Bolema paper does not contribute in any way to the conclusion that investment has been

[150] "Using this historical data, I collected figures on the previous twelve years before the Open Internet Order was adopted in February 2015. I picked 2003 as the first year because the market had just collapsed from the dot-com bubble and total broadband capex was at its lowest point since 1996. I established a trend line from 2003 to 2016, which created a linear pattern over the first 12 years before the Open Internet Order and estimated what we could have expected broadband capex to be in 2015 and 2016 without Title II public utility regulation." "Broadband Investment Slowed by $5.6 Billion Since Open Internet Order," May 05, 2017. http://freestatefoundation.blogspot.com/2017/05/broadband-investment-slowed-by-56.html
[151] AARP comments, pp. 50-54.
[152] Michael Horney, "Broadband Investment Slowed by $5.6 Billion Since Open Internet Order", The Free State Foundation, (May 5, 2017), available at: http://freestatefoundation.blogspot.com/2017/05/broadband-investment-slowed-by-56.html
[153] "Taking into account the latest USTelecom investment data, I now estimate that foregone investment in 2015 and 2016 was about $5.6 billion, an amount providers likely would have invested in a business climate without Title II public utility regulation." Horney blog post, *op. cit.*
[154] See, Theodore R. Bolema, "Too Much Unnecessary Regulation Is Impeding Telecom Investment," April 17, 2017, p. 3.
[155] *Id.* p. 8, citing to a Free State post by Randolph May, which also cites to Singer's work.

harmed by Title II. In summary, CenturyLink does not contribute any new information regarding the impact of the *2015 Title II Order* on investment, and the sources relied upon by CenturyLink are unreliable.

## B. Frontier misunderstands the Hassett/Shapiro paper on investment and Title II

To support its claims that the *2015 Title II Order* harms investment,[156] Frontier also points to the Singer, Ford, and USTelecom sources that AARP discussed in detail in opening comments.[157] Frontier also references a 2015 paper by Hassett and Shapiro that Frontier asserts shows that uncertainty associated with "regulatory overreach" decreases broadband investment by "5%-20%."[158] A review of the Hassett/Shapiro paper reveals, however, no statement that a 20% reduction in investment is associated with Title II, and it appears that Frontier misinterprets a Hassett/Shapiro hypothetical to be a prediction. In a discussion of a hypothetical, Hassett/Shapiro use the 20% figure. The use of term "micro analogy" in this quote from Hassett/Shapiro is to illustrate their general approach to the evaluation of a policy:[159]

> Once a relevant micro analogy has been identified, the policy analyst faces the challenge of assessing the likelihood that the scale of an effect suggested by the micro analogy is plausible. If theory suggests that the effect is negative, and the micro analogies suggest that the effect would be to reduce investment by 20 percent, what other information can an analyst bring to bear to assess whether the 20 percent reduction is plausible in the current case?[160]

[156] Frontier comments, p. 2.
[157] Frontier comments, pp. 2-3; AARP comments, pp. 50-61 and 102-111.
[158] Frontier comments, p. 3, citing to Kevin Hassett and Robert Shapiro, Georgetown Center for Business and Public Policy and NDN, "Regulation and Investment: A Note on Policy Evaluation Under Uncertainty, With an Application to FCC Title II Regulation of the Internet," (July 2015).
[159] "In this context, we derive three steps for a logically sound policy analogy: (1) identify the micro issue, such as rate-of-return regulation or regulatory adjustment costs; (2) compile examples of the micro issue as potential analogies; and (3) assess the plausibility of the direction and scale of the effect suggested by the micro analogy." *Hassett/Shapiro*, p. 4.
[160] Hassett/Shapiro, p. 6.

In the quoted passage, "20 percent" is clearly being used to describe a hypothetical illustration, and "20 percent" appears nowhere else in the Hassett/Shapiro paper.[161] CenturyLink is incorrect to claim that Hassett/Shapiro project a 20 percent decline in investment following Title II.

**1. The Hassett/Shapiro paper's analogy on Title II and investment is a stretch**

The Hassett/Shapiro paper does not deliver any new empirical evidence regarding the impact of Title II, and instead provides a broad overview of theoretical literature relating to regulation and investment.[162] The Hassett/Shapiro paper focuses on the impact of uncertainty on investment, and they do advance a potential 5% reduction in broadband ISP investment associated with uncertainty generated by Title II regulation.[163] This projection, however, is not based on any study of the impact of the FCC's *2015 Title II Order,* or even of any study specific to the U.S. telecommunications industry. The "5%" figure contained in the Hassett/Shapiro paper results from Hassett/Shapiro's review of a 2012 paper by Julio and Yook.[164] In their paper, Julio and Yook study the impact of uncertainty associated with national elections on investment, based on national-level aggregate investment data from 248 elections in 48 countries between 1980 and 2005.[165]

Based on the results of the Julio and Yook paper, which suggests that uncertainty associated with elections in those nations could be 5% during the period of uncertainty, Hassett/Shapiro offer the following conclusion:

[161] Hassett/Shapiro, *passim.*
[162] Hassett/Shapiro, pp. 3-15.
[163] Hassett/Shapiro, p. 20.
[164] Hassett/Shapiro, p. 9, citing to Julio and Yook (2012), "Political uncertainty and corporate investment cycles." *The Journal of Finance* 67 (1): 45-83.
[165] Julio and Yook, op. cit. Hassett/Shapiro state: "Further, Julio and Yook (2012) found similar election-sensitivity in domestic investment flows as well, with investment dropping about 5 percent during election years as investors wait for election uncertainty to be resolved. These models suggest that the forces that drive investment behave abnormally when a threshold event puts the investment on hold." Hassett/Shapiro, p. 9.

> Given the evidence presented above, if this threshold effect (of Title II) is similar to that experienced during an election year, then investment between now and the resolution of the uncertainty could be approximately 5 percent per year lower.[166]

This conclusion is highly speculative. Putting the Hassett/Shapiro prediction into context, what their conclusion says is: If the risks associated with Title II are just like the risks associated with electoral uncertainty, as measured in 48 nations between the years 1980 and 2005, and if the U.S. broadband ISP industry is just like the aggregation of businesses in those 48 nations between the years 1980 and 2005, then broadband ISP investment might go down by 5% per year until the uncertainty is resolved. This is not a convincing conclusion— national elections are an inapt analogy for Title II regulation, and the performance of a particular industry (broadband ISPs) is not likely to track the performance of businesses in national economies.

**2. Hassett/Shapiro ignore the impact of regulatory risk on edge providers**

Furthermore, the Hassett/Shapiro paper has an additional weakness, as they do not address edge provider investment, or even consider it to be relevant.[167] Thus, even if one accepts their "5% negative pressure on investment arising from uncertainty" argument, the same negative pressure applies to edge providers if Title II is removed. There is no reason why regulatory uncertainty associated with Title II should only affect broadband ISPs. The reversal of the *2015 Title II Order* would impose regulatory uncertainty on edge providers, and result in negative pressure on edge provider investment. The result might seem something like a zero-sum outcome arising from regulatory uncertainty, however, given the expansive nature of the network edge, which includes both established edge providers, new providers, and to a growing extent end users,[168] reversing the *2015 Title II Order* is likely to have a broad negative impact on investment by

[166] Hassett/Shapiro, p. 20.
[167] See discussion below.
[168] AARP comments, pp. 42-43, 48.

these entities, and to the overall society (especially in light of the fact that there is no evidence that the *2015 Title II Order* has adversely affected broadband ISP investment incentives).[169]

As noted above, Hassett/Shapiro do not approach the investment question from the proper perspective of a two-sided market, they ignore investment at the network edge entirely, and deny outright the potential for a "virtuous circle." Hassett/Shapiro state:

> Advocates of Title II regulation of the Internet argue that it will stimulate entry by "edge providers," but we are not aware of any evidence supporting this argument.[170]

This perspective indicates a lack of understanding of the Internet ecosystem, and public policy issues associated with network neutrality. As this Commission has previously recognized, the network edge is a key element in a public policy evaluation of the Internet ecosystem:

> *The Internet's openness is critical to these outcomes, because it enables a virtuous circle of innovation in which new uses of the network—including new content, applications, services, and devices—lead to increased end-user demand for broadband, which drives network improvements, which in turn lead to further innovative network uses. . . .* Continued operation of this virtuous circle, however, depends upon low barriers to innovation and entry by edge providers, which drive end-user demand. Restricting edge providers' ability to reach end users, and limiting end users' ability to choose which edge providers to patronize, would reduce the rate of innovation at the edge and, in turn, the likely rate of improvements to network infrastructure. Similarly, restricting the ability of broadband providers to put the network to innovative uses may reduce the rate of improvements to network infrastructure.[171]

In conclusion, Frontier's reliance on the Hassett/Shapiro paper to support the proposition that Title II results in a reduction of broadband investment by 5%-20% is not credible.

[169] See discussion below, and AARP comments, pp. 47-72.
[170] Hassett/Shapiro, p. 14.
[171] *In the Matter of Preserving the Open Internet, Broadband Industry Practices*, GN Docket No. 09-191, WC Docket No. 07-52, Report and Order, December 23, 2010, ¶¶13-14, citations omitted, emphasis added.

## C. Cox delivers false claims about investment and broadband speed

Cox claims that investment has been harmed by Title II,[172] and in support also points to studies by Singer and Ford that were cited in the *2017 NPRM*, and which were discussed by AARP in opening comments.[173] Cox also references the top-line CTIA study that is discussed later in this reply.[174] None of these studies offer convincing evidence of a negative impact of the *2015 Title II Order* on broadband ISP investment.

Cox identifies another study by George Ford, dated June 27, 2017, that purports to show that the growth in broadband speeds in the U.S. has declined since the *2015 Title II Order.*[175] However, like the *Ford Counterfactual* paper that AARP discussed in opening comments,[176] Dr. Ford's work on broadband speeds and Title II is fundamentally flawed, and the new Ford study fails to support the proposition that broadband speeds or broadband investment have been adversely affected by Title II. Rather, the *Ford Broadband Speed* paper shows clear evidence that regulation has little impact on the broadband speeds in the U.S. and abroad.

### 1. Dr. Ford does not like Akamai's data showing U.S. broadband speed advances

Dr. Ford's paper addresses recent Akamai data showing that broadband speeds in the U.S. have experienced substantial increases during the past two years.[177] AARP discussed the Akamai data in opening comments and concluded that Akamai's data suggests that investment is continuing in the Title II environment.[178] On the matter of the Akamai data and U.S. broadband speeds, NCTA–The Internet & Television Association, stated on June 2, 2017:

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[172] Cox comments, p. 2.
[173] Cox comments, p. 17; AARP comments, Section V and Appendix.
[174] Cox comments, p. 17.
[175] Cox comments, p. 17, citing to George S. Ford, "Broadband Speeds Post-Reclassification: An Empirical Approach 1" (Jun. 27, 2017). Hereinafter *Ford Broadband Speed.* http://www.phoenix-center.org/perspectives/Perspective17-07Final.pdf .
[176] AARP comments, pp. 54-57 and 102-111.
[177] *Ford Broadband Speed*, passim.
[178] AARP comments, pp. 66-67.

> Earlier this week, Akamai released its 2017 1st Quarter report and it revealed that on a number of key metrics, the internet in the United States took a huge leap forward compared to other countries. The US is now in the top ten countries for adoption of internet speeds over 15 and 25 Mbps as well as the top ten for overall average speed.
>
> But these gains aren't new or just limited to the last year. According to Akamai's research, broadband speeds in America over the last five years have increased from an average peak connection speed of 23.4 Mbps to 86.5 Mbps.
>
> *This near quadrupling of internet speeds in just five years is the result of constant innovation cycles and aggressive deployment of new technologies across the country.* Thanks to the constant process of growth and improvement, Gigabit cities are springing up across the country in both urban and rural communities, further driving average speeds into the stratosphere.[179]

Thus, NCTA indicates that during the last five years, a period which includes the transition to Title II, aggressive broadband deployment has occurred, culminating in the impressive Akamai data for first quarter 2017. As will be discussed below, however, in this proceeding NCTA tells the Commission a completely different story, alleging investment harms from Title II.[180] NCTA cannot have it both ways. The Akamai data that NCTA touts does not support the proposition that broadband investment has been harmed by Title II.

As is clear from the *Ford Broadband Speed* paper, while the Akamai data shows roses, Dr. Ford sees only thorns, and the *Ford Broadband Speed* paper suggests that NCTA's interpretation of the Akamai data does not show the true picture. Rather, Dr. Ford asserts that since the *2015 Title II Order*, the growth in broadband speeds is actually lower than should be expected.[181]

Regarding the Akamai broadband speed data, Dr. Ford conducts another statistical analysis, using "difference-in-difference" and regression methodologies similar to the *Ford*

[179] NCTA, "America's Internet Speeds Continue to Soar," June 2, 2017, emphasis added. https://www.ncta.com/platform/broadband-internet/americas-internet-speeds-continue-to-soar/
[180] NCTA comments, pp. 1-2.
[181] *Ford Broadband Speed*, p. 9.

*Counterfactual* paper's approach that AARP discussed in opening comments.[182] Dr. Ford's new analysis, however, raises more questions than it answers.

**2. Dr. Ford's *Broadband Speed* paper contradicts Dr. Ford's *Counterfactual Paper***

The first thing to note about the *Ford Broadband Speed* paper is that it contradicts statements made by Dr. Ford in the *Ford Counterfactual* paper (which was cited in the *2017 NPRM*, and discussed by AARP in opening comments[183]). Dr. Ford admits that broadband speeds are a function of broadband investment[184] and in the *Ford Counterfactual* paper, Dr. Ford emphasized that following a regulatory change such as the Title II reclassification, "investment decisions occur with a delay of a two-or-so years."[185] Thus, based on Dr. Ford's previous statements, the *Ford Broadband Speed* paper cannot support the proposition that Title II has harmed investment or broadband speeds. However, even if we ignore Dr. Ford's inconsistency on this matter, the balance of the *Ford Broadband Speed* paper does not support the proposition that Title II has negatively affected broadband speeds. In fact, it shows that regulation little impact on broadband speeds.

**3. Dr. Ford's *Broadband Speed* paper ignores the most recent Akamai data**

The second thing to note regarding the *Ford Broadband Speed* paper is that Dr. Ford excludes the most recent Akamai data, from the first quarter of 2017. This is surprising. This data was available to Dr. Ford, and given the very short period of time since the *2015 Title II Order*, every bit of data is important to consider.[186] The omission of a critical data point suggests that

[182] AARP comments, pp. 54-57 and 102-111.
[183] *2017 NPRM*¸ ¶45; AARP comments, pp. 54-57 and pp. 102-111.
[184] *Ford Broadband Speed*, p. 9.
[185] *Ford Counterfactual*, p. 5.
[186] Because of the paucity of data available to Dr. Ford, his analysis utilizes compensating statistical techniques to overcome the impact of a small number of observations on the generation of t-statistics. That Dr. Ford applies these techniques while leaving out available data is very unusual. For a discussion of Dr. Ford's use of the "wild bootstrap" method to improve his t-statistics, see *Ford Broadband Speed*, p. 6.

something may be afoot with the *Ford Broadband Speed* paper's approach to the data. Recall that it was the first quarter 2017 Akamai data that led NCTA to crow about the stellar broadband speed performance in the U.S. The fact that this data is missing from Dr. Ford's analysis is highly suspect.

**4. Dr. Ford's control group again has the "treatment"**

The most glaring problems with Dr. Ford's work, however, are associated with his selection of the control group for his "difference-in-difference" analysis. Like the *Ford Counterfactual* papers that AARP discussed in opening comments, the methodology of the *Ford Broadband Speed* paper employs a control group. In this case, the control group are the nations of Belgium, Denmark, Finland, Norway, and the United Kingdom. Dr. Ford also utilizes a "pre-treatment" period (2012-2014) and a "treatment" period (2015-2016), with the "treatment" being the *2015 Title II Order*. Dr. Ford indicates that because the control group and U.S. have similar performance in the "pre-treatment" period, the U.S. and control group should have similar performance in the "treatment" period. If the performance of the control group and the U.S are similar in the "pre-treatment period," then differences observed in the "treatment" period may be correlated with the "treatment," in this case the *2015 Title II Order*.[187] For this to make sense, however, the control group should not be subject to the "treatment," i.e., Title II regulation or regulatory restrictions that are similar to those enabled by Title II.[188]

Given Dr. Ford's setup, the additional problems with the *Ford Broadband Speed* paper become obvious. First of all, the control group is also subject to network neutrality policies and regulations, as imposed by the European Union, and as a result, the "treatment" is present in the

[187] *Ford Broadband Speed*, passim.
[188] See AARP comments, pp. 103-107. Clearly, European nations are not governed by U.S. telecom law, but have their own legislative foundations.

control. The EU's network neutrality rules have been a work in progress since 2010, when the EU announced general network neutrality principles.[189] The EU's 2010 network neutrality vision was legally mandated in 2015, when the EU passed network neutrality legislation.[190] In 2016, the EU published guidelines that increased the stringency of the 2015 legislation.[191]

Furthermore, as discussed in the USTelecom brief on investment cited by the *2017 NPRM*,[192] general regulatory restrictions in the EU are much more onerous than in the U.S., as the EU enforces rate regulation and broadband unbundling requirements.[193] Thus, regardless of the timing of the EU's network neutrality rules, the baseline level of regulation in Dr. Ford's control group is more restrictive than in the U.S.—the EU is much more "Title II" in its orientation than has been the case in the U.S.

[189] "Users and service, application or content providers should be able to gauge the impact of network management measures on the enjoyment of fundamental rights and freedoms, in particular the rights to freedom of expression and to impart or receive information regardless of frontiers, as well as the right to respect for private life. Those measures should be proportionate, appropriate and avoid unjustified discrimination; they should be subject to periodic review and not be maintained longer than strictly necessary. Users and service providers should be adequately informed about any network management measures that affect in a significant way access to content, applications or services. As regards procedural safeguards, there should be adequate avenues, respectful of rule of law requirements, to challenge network management decisions and, where appropriate, there should be adequate avenues to seek redress." Council of Europe, Declaration of the Committee of Ministers on network neutrality (Adopted by the Committee of Ministers on 29 September 2010 at the 1094th meeting of the Ministers' Deputies). https://search.coe.int/cm/Pages/result_details.aspx?ObjectID=09000016805ce58f

[190] See, for example, "EU Parliament passes net neutrality law, but tech companies are unhappy," *The Telegraph,* October 27, 2015. http://www.telegraph.co.uk/technology/internet/11958747/EU-Parliament-passes-net-neutrality-law-but-tech-companies-are-unhappy.html ; see also: https://ec.europa.eu/digital-single-market/en/policies/open-internet-net-neutrality

[191] See, for example, "Europe's net neutrality guidelines seen as a victory for the open web. Regulatory body tightens loopholes that could have jeopardized the future of the internet, advocates say," *The Verge*, August 30, 2016. https://www.theverge.com/2016/8/30/12707590/eu-net-neutrality-rules-final-guidelines-berec . See also: http://berec.europa.eu/eng/news_and_publications/whats_new/3958-launch-of-the-berec-net-neutrality-guidelines

[192] "On the whole, Europe has pursued a markedly more regulatory approach to broadband infrastructure than has the U.S. That approach has been built on accepting a single network provider model with intrusive price regulation (e.g., open access, unbundling) to attempt to create competition over that network by opening it to other firms." Patrick Brogan, USTelecom, "Utility Regulation and Broadband Network Investment: The EU and US Divide," Research Brief (Apr. 25, 2017), p. 1. *Hereinafter USTelecom US/EU Divide Brief.*

[193] *USTelecom US/EU Divide Brief.*

Regarding broadband speeds, Dr. Ford states that performance during the "pretreatment" period of 2012-2014 for the control group and the U.S. are "alike." To illustrate, Dr. Ford provides a graph, which is reproduced below:[194]

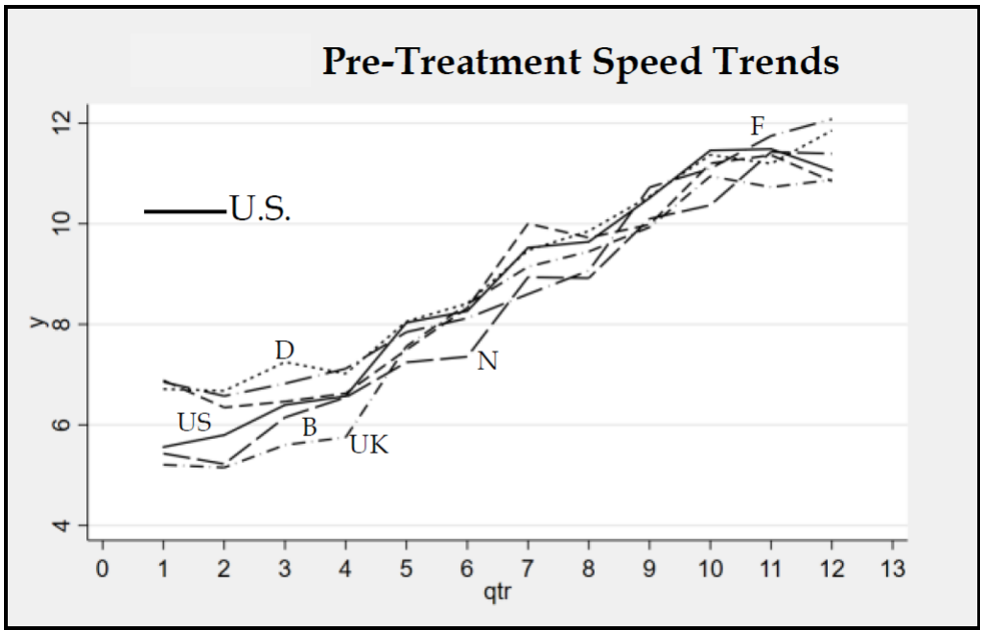


**Figure 2: The *Ford Broadband Speed* paper's Figure 3.**

Dr. Ford explains:

> The final control group includes five countries: Belgium, Denmark, Finland, Norway, and the United Kingdom. Figure 3 illustrates the speed data (in levels) for the U.S. and control countries for the 12 quarters in the pretreatment. The pre-treatment trends and average speeds are alike.[195]

Given the higher levels of regulation present in the EU (i.e., both standard public utility requirements like unbundling and price regulation, *and* network neutrality policies), what his study shows is that *regulatory restrictions do not have much of an impact on broadband speeds*

[194] *Ford Broadband Speed*, p. 5. D = Denmark, N = Norway, F = Finland, B = Belgium, UK = United Kingdom.
[195] *Ford Broadband Speed*, p. 5.

*across nations in his study*. During the "pretreatment" period, the more heavily-regulated Europe does just as well as the U.S.

Given the numerous flaws in the *Ford Broadband Speed* paper—the missing Akamai data from 2017, Dr. Ford's own admission that it takes two years for the impact of regulatory change to show up in investment data, and a control group that is more heavily regulated than U.S. broadband ISPs—Dr. Ford cannot support any conclusion on the relationship between Title II and broadband speed. Cox's reliance on this paper does not support Cox's "Title II hurts investment" claim.

### D. Comcast's investment analysis also rehashes the "usual suspects"

Comcast claims that the *2015 Title II Order* has harmed investment decisions.[196] Comcast provides a paper by Christian Dippon, a NERA Consultant.[197] On the matter of investment, the *Comcast/NERA* paper does not contribute any new information. Instead, the *Comcast/NERA* paper revisits the "counterfactual" analysis conducted by George Ford, which AARP has demonstrated suffers from numerous shortfalls.[198]

*Comcast/NERA* also points to the results of the top-line survey by CTIA, which found a decline in wireless carrier capital expenditures between 2015 and 2016.[199] Regarding this statistic, *Comcast/NERA* concede that unlike the Ford counterfactual, the CTIA offers no comparison group. "No comparison group is offered, which makes a clear interpretation somewhat challenging."[200] AARP agrees that without comparative context, and/or controlling for other

[196] Comcast comments, p. 27.
[197] Public Interest Repercussions in Repealing Utility-Style Title II Regulation and Reapplying Light-Touch Regulation to Internet Services, NERA, July 17, 2017. Hereinafter *Comcast/NERA.*
[198] AARP comments, pp. 54-57 and pp. 102-111.
[199] *Comcast/NERA*, p. 33.
[200] *Comcast/NERA*, p. 33.

factors that can influence investment decisions, raw numbers do not offer much insight. As discussed in AARP's opening comments, numerous factors, such as the timing of investment projects, technological change, and general economic trends can affect investment decisions, and one-year data series, such as that identified by CTIA, provide little useful information.[201]

*Comcast/NERA* also point to the Free State Foundations' Michael Horney to support the proposition that broadband investment has declined since the *2015 Title II Order*.[202] As discussed above in this reply, the Horney analysis is subject to significant flaws, and openly admits that it can make no connection between investment and the *2015 Title II Order*.

*Comcast/NERA* also point to another George Ford analysis that expands on the Horney blog post, and conducts a "statistical" evaluation of the 2016 USTelecom and CTIA data on investment. However, unlike Horney (or *Comcast/NERA*), Ford is at least up front about the weakness of the analysis:

> Admittedly, for purposes of statistical analysis, there is a paucity of data. Both USTelecom and CTIA offer short time series of investment data and there is only one year of capital spending data following the 2015 Open Internet Order. The dot-com bubble, following an investment frenzy after the Telecommunications Act of 1996, further taints the data.[203]

This additional Ford analysis does not lead to a very convincing conclusion. Dr. Ford admits that attributing declines in "capital spending to the 2015 Open Internet Order is not permitted absent a meaningful counterfactual."[204] But the absence of meaningful support for the investment trend does not stop Dr. Ford from claiming that "something is afoot in the broadband

[201] AARP comments, pp. 51-54.
[202] *Comcast/NERA*, p. 34.
[203] Dr. George S. Ford, Reclassification and Investment: A Statistical Look at the 2016 Data, July 13, 2017, p. 2. http://www.phoenix-center.org/perspectives/Perspective17-08Final.pdf
[204] *Id.*, p. 6.

business."[205] Unsupported speculation, however, is not a reasonable foundation for important public policy decisions. As noted by AARP in opening comments,[206] and further discussed in this reply, historical evidence shows that broadband investment occurred at high levels under Title II. One year's worth of data does not undermine this fact.

In conclusion, the *Comcast/NERA* analysis does not provide any reliable information regarding broadband investment, and Comcast's claims that broadband investment has been harmed by Title II are not supported.

### E. Charter also uses the "usual suspects" to support its investment claims

Charter comments point to the Singer and Ford studies that were discussed by AARP in opening comments, and also points to the Horney study discussed above in this reply.[207] Charter does not offer any new insight regarding investment and Title II.

## XII. NCTA's Owen paper contains factual misstatements and adds nothing to the Title II-investment issue

As discussed above, NCTA recently gushed about the success of broadband deployment and broadband speed growth in the U.S. in the period following the *2015 Title II Order*.[208] However, less than six weeks later, NCTA takes an entirely different position before the Commission in comments, stating that "The chilling effects of Title II already have begun to be felt in the form of decelerating broadband network investment. Such decelerating investment, in turn, means decelerating broadband speed increases, slowed rural deployment, and delayed or forgone opportunities to roll out innovative and procompetitive service offerings to consumers."[209] To

[205] *Id.*, p. 6.
[206] AARP Comments, pp. 60-61. See also pp. 106-108.
[207] Charter comments, pp. 9-10. For rebuttal, see, AARP comments, pp. 50-57 and 102-111.
[208] NCTA, "America's Internet Speeds Continue to Soar," June 2, 2017. https://www.ncta.com/platform/broadband-internet/americas-internet-speeds-continue-to-soar/
[209] NCTA Comments, pp. 1-2.

support their new position, NCTA offers the work of Bruce Owen. Like the other consulting reports discussed above, Mr. Owen provides a theoretical discussion of the relationship between regulation and investment.[210] Beyond the theoretical discussion, Mr. Owen exhibits a weak understanding of the regulatory history of broadband Internet access services. Mr. Owen states that the "reasonableness standards" in Sections 201 and 202 "have never been applied to Internet access services."[211] This statement is factually incorrect, broadband services provided by telephone companies were provided under Title II, and subject to the "reasonableness" standards until 2005.

Regarding the impact of the *2015 Title II Order* on investment, Mr. Owen offers no new information. He admits that measuring the impact of the *2015 Title II Order* is difficult:

> Measurement difficulties also arise because we have data only for the two years since the adoption of the Title II Order. Many of the investments made in 2015 and 2016 were set in motion several years before, and could not have reflected a general belief that common carrier regulation was inevitable. Moreover, the long-term viability of the Order has been in serious doubt throughout this two-year period, as it has been under judicial review, and subject to legislative repeal efforts.[212]

In spite of these difficulties, to support the claim that Title II has harmed investment, Dr. Owen points to the 2017 *Hazlett/Wright* paper that was discussed above; to the Singer blog post that was discussed in AARP's opening comments;[213] to the Horney blog post discussed above; the CTIA top-line survey discussed above; and the *Ford Counterfactual* paper that AARP discussed in opening comments.[214] Thus, Dr. Owen adds nothing new to the discussion.

[210] *NCTA/Owen*, pp. 2-6.
[211] *NCTA/Owen*, p. 12.
[212] *NCTA/Owen*¸ p. 10.
[213] *NCTA/Owen*¸ pp. 12-13. AARP comments, pp. 50-54.
[214] AARP comments, pp. 54-57 and 102-111.

The NCTA comments, and *NCTA/Owen* paper do not support the proposition that the *2015 Title II Order*, or Title II regulation in general, have reduced investment. Rather, as NCTA noted on June 2, 2017:

> *This near quadrupling of internet speeds in just five years is the result of constant innovation cycles and aggressive deployment of new technologies across the country.* Thanks to the constant process of growth and improvement, Gigabit cities are springing up across the country in both urban and rural communities, further driving average speeds into the stratosphere.[215]

In other words, broadband deployment and speed gains have been robust following the *2015 Title II Order.*

## XIII. CTIA's Hahn paper adds no information regarding the impact of the *2015 Title II Order* on investment

CTIA offers a paper by Robert Hahn titled "How Economics Can Inform Telecommunications Policy: The FCC's Proposed Action on Restoring Internet Freedom."[216] While the orientation of this paper applies an analytical framework for regulatory intervention that Dr. Hahn developed for a 2007 journal article,[217] he does provide a few comments on the purported impact of the *2015 Title II Order* on investment.

Before turning to the topic of investment, with regard to Dr. Hahn's framework, it is based on the premise that regulatory intervention is only appropriate where there is evidence of market failure.[218] However, the *CTIA/Hahn* paper takes a very narrow view of what constitutes market failure, focusing on whether "(1) evidence that output is significantly above (or below) socially optimal levels or (2) evidence that prices are significantly above (or below) appropriate measures

[215] NCTA, "America's Internet Speeds Continue to Soar," June 2, 2017, emphasis added. https://www.ncta.com/platform/broadband-internet/americas-internet-speeds-continue-to-soar/
[216] CTIA comments. Hereinafter *CTIA/Hahn.*
[217] *CTIA/Hahn*, p. 6, ¶18.
[218] *CTIA/Hahn*¸ p. 1.

of costs."[219] The evidence reviewed by Dr. Hahn on the matter of market failure is also very narrow, focusing on output and prices of broadband services.[220] Thus, Dr. Hahn's approach to the question of market failure, and the potential need for network neutrality rules, is focused exclusively on one side of the two-sided broadband market. Dr. Hahn's study does not address the potential market failure that arises due to the externality issue arising with two-sided markets (i.e., the positive feedback loop between the edge and broadband ISPs, which supports the "virtuous circle" theory advanced by the FCC in its *2010 Open Internet Order*, and *2015 Title II Order*). As such, Dr. Hahn's assessment of the appropriateness of Title II misses the core element of economic theory associated with the broadband marketplace.

Regarding the investment issue, Dr. Hahn does not deliver any new information. He cites exclusively to the work by Hal Singer,[221] that was discussed in detail in AARP's opening comments. In summary, the *CTIA/Hahn* paper does not show any negative impact of the *2015 Title II Order* on investment.

## XIV. USTelecom shows strong broadband investment and speed gains under Title II

The comments of USTelecom raise the issue of a negative impact of Title II on broadband ISP investment,[222] and USTelecom advances the conclusions of the USTelecom white paper on the U.S. vs. European investment experience that was raised in the *2017 NPRM*, and discussed by AARP in opening comments.[223] However, while claiming that Title II harms investment, USTelecom's comments provide examples of robust investment performance following the *2015*

[219] *CTIA/Hahn*, p. 7.
[220] *CTIA/Hahn*, pp. 7-10.
[221] *CTIA/Hahn*, pp. 17-18
[222] USTelecom comments, pp. 36-37.
[223] USTelecom comments, pp. 4-5. AARP comments, pp. 57-61.

*Title II Order*. USTelecom states that "the U.S. leads the world in Internet use and growth," and USTelecom highlights the growth of broadband speeds following the *2015 Title II Order*. USTelecom states that "In 2016, roughly 91 percent of U.S. homes could access networks capable of 25 Mbps and 76 percent of U.S. homes can access networks capable of 100 Mbps."[224] USTelecom also presents a chart (reproduced below) showing strong growth in broadband speeds at the 25/3Mbps benchmark between 2014 and 2016, with the number of households with access at this speed increasing from 34% to 49%.

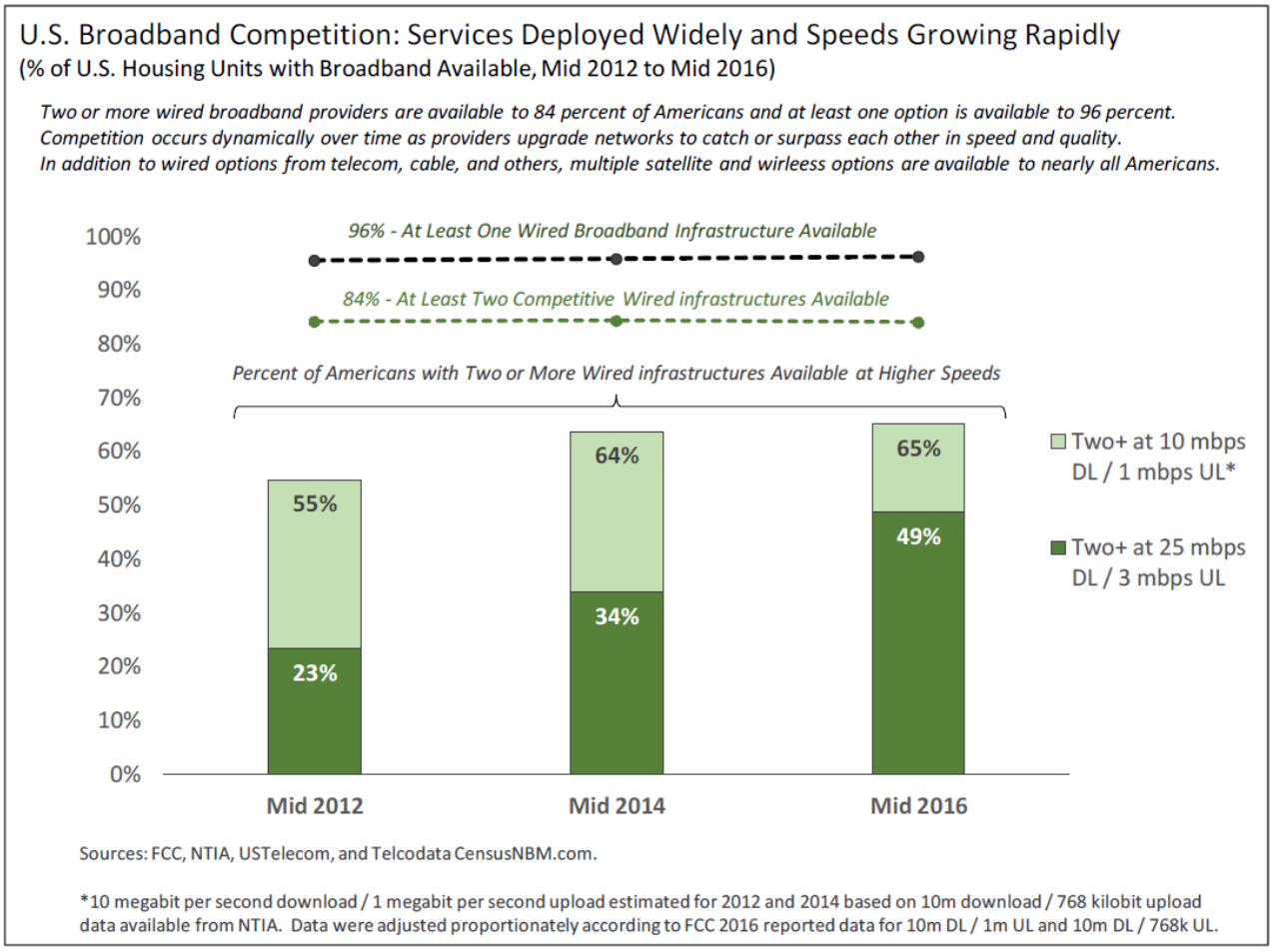


**Figure 3: USTelecom chart on broadband competition**

[224] USTelecom comments, pp. 5-6.

USTelecom does not provide convincing evidence that Title II harms investment. As noted by AARP in opening comments, USTelecom data shows strong investment under Title II during the 1996-2005 period, when telephone company broadband was regulated under Title II.[225] USTelecom's comments show evidence that investment following the *2015 Title II Order* continues to impress USTelecom.

## XV. Other parties supporting broadband ISP positions on investment

The discussion above shows that broadband ISPs and their trade groups claim that the *2015 Title II Order* has harmed investment, but their comments fail to produce convincing evidence on the matter. Other parties also support the broadband ISP perspective. However, their arguments and evidence also fail to convince.

### A. "Economic Scholars" on investment

AARP's opening comments responded to the *2017 NPRM's* claims that investment has been harmed by the *2015 Title II Order*, and AARP also addressed elements of the academic literature associated with Title II and social welfare.[226] AARP noted that while most academic studies correctly considered more than broadband ISP investment, and addressed investment from a social welfare perspective, the results of academic studies were "nuanced, conditioned on numerous assumptions, and not always in agreement."[227] A group calling itself "Economic Scholars" filed comments that focus on the academic literature and generally describe conclusions from the academic literature that are consistent with AARP's review, i.e., academic

[225] AARP comments, pp. vii & viii; pp. 7 & 8.
[226] AARP comments, Sections V and VI(D).
[227] AARP Comments, p. 68.

research considers more than broadband ISP investment, but that research shows a lack of agreement on the larger question of social welfare. Economic Scholars state:

> The economics research on net neutrality has found that the impacts of regulations depend on the conditions in the marketplace. Under various conditions, the regulations can be harmful to consumers, harmful to network providers, harmful to content providers, or hinder investment. *But there are also conditions under which opposite effects can occur.* Most of the articles that were found conclude that regulatory restrictions on what enhanced services ISPs may offer to content providers can lower economic efficiency, *but the articles are not unanimous in this conclusion*.
>
> Regarding total welfare, the literature finds that the welfare effects of regulation depend on market conditions, such as whether ISPs are monopolies, how charges might be implemented, network engineering, and the types and variety of content provided on the internet. Most articles find that the regulations decrease welfare. *The literature gives mixed results regarding the effects of regulation on investment because the investment incentive is sensitive to how content providers and consumers respond to prices and to how consumers value content. The literature also gives mixed results regarding the effects of strict net neutrality regulations on content markets because content providers vary in their preferences for advanced network features, such as fast lanes. Regarding the blocking of content that customers want to access, the research was nearly unanimous in finding that restrictions on such blocking benefited customers.*[228]

These conclusions on the academic literature are similar to AARP's.[229] However, the Economic Scholars' also address the question of "whether ISP internet services have essentially the same economic natures (*sic*) as services for which Title II was written."[230] To evaluate this question, the Economic Scholars propose a two-prong test:

> The economic conditions for which Title II was written were situations where a service was critical for a community's economic well being and unregulated service providers had both a strong incentive and the ability to engage in discriminatory activities that caused economic harm.[231]

[228] Economic Scholars' comments, p. 10.
[229] AARP comments, pp. 68-70.
[230] Economic Scholars' comments, p. 9.
[231] Economic Scholars' comments, p. 9.

With regard to the first part of the test (a service being critical for a community's well being), Economic Scholars state that there is little disagreement in the economics literature that Internet services serve an important public welfare role. On the second prong of the test (incentive and ability of broadband ISPs to engage in discriminatory practices and cause economic harm), the Economic Scholars conclude that "These conditions do not appear to fit today's internet markets."[232]

AARP finds little support for this conclusion in the Economic Scholars' comment. Regarding the question of whether broadband providers have the ability to cause economic harm, the Economic Scholars' "literature review" is very narrow, citing only *two* academic articles.[233] One of those articles, a 2016 article from the *Journal of Economic Perspectives*, provides no conclusions on the question,[234] and the Economic Scholars concede that it gives "mixed answers."[235] The remaining journal article relied upon by Economic Scholars to support the proposition that broadband ISPs do not have incentives and the ability to engage in discriminatory practices is a 2017 article by Timothy Brennan.[236] The premise of the Brennan article is that there have been only *four* instances where broadband ISPs have violated network neutrality principles, and that this suggest a lack of potential harms.[237]

[232] Economic Scholars' comments, pp. 10-11.
[233] Economic Scholars' comments, p. 9
[234] "There are, however, a number of open research questions in this setting because the situation involves multiple participants in complementary economic relationships where they share the costs and benefits of actions, and users benefit from improvement and investment. It should come as no surprise, therefore, that the thrust of the conclusions from economic analysis tilt against simplistic declarations in favor or against net neutrality." Greenstein, Shane, Martin Peitz, and Tommaso Valletti, "Net Neutrality: A Fast Lane to Understanding the Trade-offs," *Journal of Economic Perspectives*, Vol. 30, No. 2 (Spring 2016) p. 146.
[235] Economic Scholars' comments, p. 9.
[236] Brennan, Timothy, "The Post-Internet Order Broadband Sector: Lessons from the Pre-Open Internet Order Experience," *Review of Industrial Organization* 50 (2017) 469-486.
[237] Economic Scholars, p. 9. See also Brennan, op. cit., pp. 471-472.

**1. There are numerous examples of broadband ISPs exercising their market power**

The Economic Scholars' and Brennan's view of ISP behavior is overly narrow, as there have been more than four instances where broadband ISPs have flouted network neutrality principles. For example, as noted in comments by ACLU, ISP market power, if not checked, leads to a definite threat to Internet openness, pointing to global experience:

> Absent net neutrality rules, ISPs have the power to censor political speech, to prevent competitors from reaching their customers over the Internet, and to reshape the Internet so that paid commercial content crowds out education, research, and news. The risks of allowing ISP discrimination are illustrated by incidents abroad, where neutrality norms have been less robust historically. ISPs discriminate against particular speakers and technologies even in jurisdictions with strong transparency requirements and significantly more competition than in the United States. Such discrimination affects over 75% of subscribers in the United Kingdom and at least one in five subscribers in the European Union. They include restrictions on online phone services, file transfer technologies, and gaming, streaming, email, and messaging applications. One Canadian ISP even blocked access to the speech of its political opponents.[238]

Other parties provide specifics associated with U.S. ISP behavior that violate network neutrality principles that include:[239]

- Madison River (NC) blocking VOIP service Vonage in 2005
- Comcast's 2007-2008 blocking of BitTorrent
- AT&T using its deal with Apple to block the use of Skype on initial versions of the iPhone from 2007-2009
- Windstream's 2010 packet hijacking to redirect people's search queries from the service of their choice to one chosen by Windstream

[238] ACLU Comments, unnumbered 14th and 15th pages.

[239] See, Joint Comment of Internet Engineers, Pioneers, and Technologists on the Technical Flaws in the FCC's Notice of Proposed Rule-making and the Need for the Light-Touch, Bright-Line Rules from the Open Internet Order, pp. 34-40; Comments of Andrew Norton, TorrentFreak.com, pp. 8-9; ACLU Comments, unnumbered 14th-17th pages; Electronic Frontier Foundation comments, pp. 14-15; Akamai comments, p. 7; Entertainment Software Association, p. 7; Microsoft comments, pp. 12-13; Writers Guild of America Comments, pp. 8-12.

- AT&T, Verizon and Sprint's 2011 actions to kill competition from Google Wallet, and push customers to 'ISIS', a mobile payment service in which they had a financial stake.

- Verizon's 2012 blocking of customer's ability to use bandwidth they had purchased for tethering without paying extra fees, despite it being a violation of a 2008 agreement with the FCC.

- AT&T's 2012 blocking of data sent to and from users of Apple's Facetime software.

- Comcast's 2012 announcement that it would favor its own video-on-demand streaming services over third-party competitor services, by charging customers for the data they used to stream competitor services.

- Comcast and Verizon's creation of artificial scarcity of interconnection ports for CDNs serving Netflix traffic in 2013/2014.

- In September 2013, an engineer for the VPN company Golden Frog noticed that he was unable to send email securely because his wireless provider (AIO Wireless, which then merged with Cricket Wireless) was stripping the encryption off his connections to mail servers.

- Verizon's 2015 admission that it was modifying its customers' traffic without their consent by inserting unique tracking ID numbers into the data its customers send. In this case, the modification of customer traffic allowed third-parties to track Verizon's customers as they browsed the web, even if those customers made efforts to ensure their privacy (e.g. by clearing cookies or using Incognito or Private Browsing Mode).

- AT&T's 2016 "zero-rating" decision to not charge customers for data used by its DIRECTV content, while charging third-parties more to similarly zero-rate data. The FCC's own investigation found that "AT&T offers Sponsored Data to third party content providers at terms and conditions that are effectively less favorable than those it offers to its affiliate, DIRECTV. Such arrangements likely obstruct competition for video programming services delivered over mobile Internet platforms and harm consumers by inhibiting unaffiliated edge providers' ability to provide such service to AT&T's wireless subscribers."

- Verizon's 2016 zero-rating via its go90 program, while charging third-parties more to zero-rate data through its FreeBee Data 360 program. As the FCC's report explained, Verizon had "no safeguards that would prevent Verizon from offering substantially more

costly or restrictive terms to enable unaffiliated edge providers to offer services comparable to Verizon's go90 on a zero-rated basis."

- T-Mobile's 2016 artificial throttling of its customers' video downloads, even when there was no benefit to customers (i.e. the download was not zero-rated). Additionally, T-Mobile lied to its customers about how the Binge On program worked, claiming that T-Mobile itself was somehow "optimizing" streaming video, when T-Mobile had in fact not deployed any technology that altered the video stream in any way except for slowing it down.

The ability to prevent competitive and consumer harms such as these is a benefit of the *2015 Open Internet Order* that the Commission must recognize.

**2. The New York Attorney General provides critical evidence of broadband ISP abuse**

Furthermore, in comments filed in this proceeding the Attorney General of New York includes details of broadband ISPs' interference with the flow of legal, user-requested content. These actions have harmed both edge providers and the customers of broadband ISPs. Importantly, the Attorney General of New York documents that interference with customer-requested data was a deliberate business decision:

> Our investigations of BIAS providers operating in the State of New York have uncovered evidence showing that, in the absence of regulation, BIAS providers pursue tactics that disadvantage edge providers and degrade their customers' experiences in pursuit of their bottom line. Evidence of how BIAS providers handled interconnection disputes when interconnection was outside the scope of the Commission's regulatory purview is the best evidence of how those providers will approach other practices, including blocking, throttling, and paid prioritization, if the Commission were to roll back Title II regulation.[240]
>
> In mid-2015, NYOAG opened several state consumer fraud investigations into the practices of BIAS providers operating in New York State. Among the practices NYOAG has examined are providers' representations in advertisements about their ability to deliver consistent and reliable access to services offered by popular edge providers. As part of those investigations, NYOAG received and reviewed internal documents from

[240] The People of the State of New York by Attorney General Eric T. Schneiderman, comments, p. 3.

> BIAS providers, such as executive presentations on corporate strategy and internal emails. *These documents establish for the first time that the long-running interconnection disputes that harmed consumers and edge providers were the result of BIAS providers' deliberate business decisions to use degraded service to consumers as leverage to extract payments from backbone and edge providers. NYOAG's investigations have uncovered evidence that this deliberate tactic was used for years by at least two of the country's biggest BIAS providers who operate in New York and in many other states.*[241]

The New York Attorney General provides relevant details on the business strategy of Spectrum-Time Warner Cable that clearly show broadband ISP behavior that necessitates the protections contained in the *2015 Open Internet Order,* and also illustrates the ongoing gatekeeper power of broadband ISPs.

> Spectrum-TWC's internal documents show that these interconnection disputes were not related to technical limitations or the cost of upgrading its systems to add capacity but rather were the result of Spectrum-TWC's deliberate business decision to use congestion to strong-arm backbone providers and edge providers into "paying [] for access" to Spectrum-TWC's subscribers. Spectrum-TWC did so by refusing to add ports at interconnection points, effectively limiting the ability of backbone and edge providers to deliver content to subscribers, unless the backbone or edge provider agreed to pay for access to subscribers. A 2011 strategy presentation titled "Internet Economics," described Spectrum-TWC's approach. The document made clear that the company intended to shift its interconnection strategy from a "cost recovery model to a full business model" by converting "some legacy settlement-free peers to Paid Interconnect." Spectrum-TWC had already deliberately "frozen port upgrades" with one interconnection peer at settlement-free interconnection points, causing overflow traffic to be redirected through other routes into Spectrum-TWC's network. These alternate routes were more expensive for both the interconnection peer and Spectrum-TWC. Spectrum-TWC recognized that, as both sides were incurring additional costs, it had effectively started a "game of chicken." It expected, however, that the interconnection peer would ultimately yield and agree to a paid arrangement in order to avoid the more expensive routing options. "[T]he short-term costs" that Spectrum-TWC incurred from the more expensive routing would therefore "eventually lead to longer-term revenue growth and cost containment."[242]

The New York Attorney General concludes:

[241] The People of the State of New York by Attorney General Eric T. Schneiderman, comments, pp. 5-6, emphasis added.
[242] The People of the State of New York by Attorney General Eric T. Schneiderman, comments, p. 7.

> The interconnection disputes examined by NYOAG demonstrate that large BIAS providers leveraged and, absent regulation, will continue to leverage, their privileged positions as gatekeepers to extract payments from backbone and edge providers at the expense of their customers. And the evidence that BIAS providers acted in this manner in the context of interconnection is the best evidence of how they will act in other contexts (e.g., blocking, throttling, paid prioritization). Indeed, it was the Commission's regulation of interconnection arrangements through Title II in the 2015 OIO that largely ended ongoing interconnection disputes. The Commission must retain all of the protections found in the 2015 OIO to prevent BIAS providers from engaging in this type of conduct in the future.[243]

This information from the New York Attorney General must be considered by the Commission as it weighs the costs and benefits of the *2015 Title II Order*. This evidence shows that business incentives of broadband ISPs can generate real and substantial harms to consumers and edge providers. The prevention of harms to consumers and edge providers is a benefit of the *2015 Title II Order's* enforceable open Internet rules, and the Commission must recognize this important benefit.

Returning to the claims of the Economic Scholars regarding the alleged inappropriateness of using Title II to ensure open Internet principles, the foundation for this conclusion ignores significant information regarding nefarious broadband ISP practices. The fact that only four of these examples are addressed in the 2017 Brennan article referenced by the Economic Scholars indicates a lack of completeness in Brennan's work, and casts doubt on Brennan's and Economic Scholars' conclusions. The Economic Scholars' claim that today's market conditions do not justify a Title II framework is not well supported.

[243] The People of the State of New York by Attorney General Eric T. Schneiderman, comments, pp. 10-11.

## B. Dr. Singer's new analysis of investment does not improve his previous blog post

AARP's opening comments discussed claims regarding alleged declines in broadband investment following the *2015 Title II Order* made by Hal Singer.[244] Dr. Singer filed a short opening comment on July 17, 2017, and AARP finds that Dr. Singer's new comment is no more convincing than his blog posts. Dr. Singer states that "the 2015 reclassification is correlated with an investment decline,"[245] however, unlike the Singer blog post that was relied upon by the *2017 NPRM*,[246] Dr. Singer now admits that correlation does not prove causation.[247] Further discussing the lack of causation, Dr. Singer also states:

> If not Title II, what else could have changed in 2015 that caused broadband investment to decline? There are alternative hypotheses, such as the possibility that next-generation broadband networks do not require the same level of capital expenditure relative to operating expenditure, but no one to my knowledge has demonstrated the significance of 2015 to that story.[248]

As discussed in detail in AARP's opening comments, next-generation technology is part of the story—for example, AT&T's CEO has clearly explained how technological change is decreasing AT&T's capital spending.[249] Furthermore, Dr. Singer ignores the lumpiness of broadband ISP investment, as reflected in the completion of a massive capital investment program by AT&T in 2014.[250] Recall, that due to its large size, AT&T has a significant impact on the overall

[244] See, AARP comments, pp. 50-55. It has come to AARP's attention that the reference to the Singer blog post that appears in footnote 170 of AARP's comments inadvertently omitted reference to Singer's March 1, 2016 blog post, that is discussed throughout AARP's comments. That citation is: "2016 Broadband Capex Survey: Tracking Investment in the Title II Era," March 1, 2016. https://haljsinger.wordpress.com/2017/03/01/2016-broadband-capex-survey-tracking-investment-in-the-title-ii-era/
[245] Singer comments, p. 3.
[246] Hal Singer, 2016 Broadband Capex Survey: Tracking Investment in the Title II Era (Mar. 1, 2016). https://haljsinger.wordpress.com/2017/03/01/2016-broadband-capex-survey-tracking-investment-in-the-title-ii-era
[247] Singer comments, p. 5.
[248] Singer comments, p. 5.
[249] AARP comments, pp. 51-54.
[250] AARP comments, pp. 51-54.

investment measured by the Singer blog post.[251] These factors cast further doubt on Singer's "2015 reclassification is correlated with an investment decline" argument.

Dr. Singer advances a "difference-in-differences" argument regarding the impact of Title II on telephone company investment, pointing to cable company investment as the appropriate control group. Dr. Singer claims that his study proves that telephone company investment was "slowed" by $1 billion per year under Title II,[252] however, Dr. Singer's new study is not well constructed, and sheds no light on the question of broadband investment and Title II. Rather than using data from a single data set, he draws data from a 2009 Columbia Institute for Tele-Information ("CITI") study, and a 2002 Telephone Industry Association ("TIA") study. Dr. Singer uses the data from the 2009 CITI study for the endpoint in his study,[253] and the 2002 TIA study as the starting point.[254] These reports rely on different data sources for their reports of capital expenditures, so the time series that Dr. Singer relies upon is not based on consistent data, and raises doubts regarding just what trends in the data are showing.

Furthermore, Dr. Singer's "difference-in-difference" approach overlooks key dissimilarities between ILEC and cable technology, and separate investment priorities over time. Certainly, the ILEC and cable industries rely on different technology platforms, and using only capex data does not control for obvious technological differences—one technology platform may have different investment needs than another, and be subject to different technological and market motivations

[251] AARP comments, p. 54.
[252] Singer comments, p. 9.
[253] The CITI study provides data for 2008, based on "Average of analyst data provided to CITI." See, Robert Atkinson & Ivy Schultz, "Broadband in America: Where Is It and Where Is It Going? Preliminary Report Prepared for the Staff of the FCC's Omnibus Broadband Initiative," Nov. 2009, p. 66, Table 15. http://www.broadband.gov/docs/Broadband_in_America.pdf
[254] The TIA study provides 1996 data based on J. Parmelee, "Telecom Equipment - Wireline Update," Credit Suisse First Boston, September 26, 2002. See, Investment, Capital Spending and Service Quality in U.S. Telecommunications Networks: A Symbiotic Relationship, TIA, November 13, 2002, p. 5. http://www.tiaonline.org/policy_/publications/filings/documents/Nov13-2002_CapEx_QoS_Final.pdf

for investing. For example, in the historical transformation of networks, cable companies had "fat one-way pipes" that needed to be upgraded to deliver two-way broadband services; telephone companies had two-way "narrow pipes" that needed to be upgraded to provide more overall bandwidth. These technological differences do not suggest an identical investment path for cable and telephone companies. While, Dr. Singer concludes that it can only be Title II that is driving the difference,[255] the methodology of Dr. Singer's new study is just as flawed as his earlier blog post, and sheds no light on the impact of Title II on investment.[256]

Dr. Singer points to USTelecom data that he claims is the industry "gold standard."[257] However, in a further discussion of the impact of Title II on telephone company investment, Dr. Singer is selective in his use of the USTelecom data, and argues that answers to questions about the impact of Title II on investment hinge on whether "one includes the years 1999 and 2000 as part of the pre-2005 period."[258] AARP notes that 1999 and 2000 were in fact part of the "pre-2005 period," and ignoring this data does not seem reasonable. However, even if one decides to ignore data for those years, the "gold standard" USTelecom data shows higher wireline broadband investment in the Title II period between 1996 and 2005 than in the Title I period between 2006 and 2015.

[255] Singer comments, p. 9.
[256] Dr. Singer also claims that a difference-in-difference study based on an alternative data set, using USTelecom data shows even a larger investment difference. However, Dr. Singer does not supply this data. Singer comments, p. 9.
[257] Singer comments, p. 4.
[258] Singer comments, p. 9.

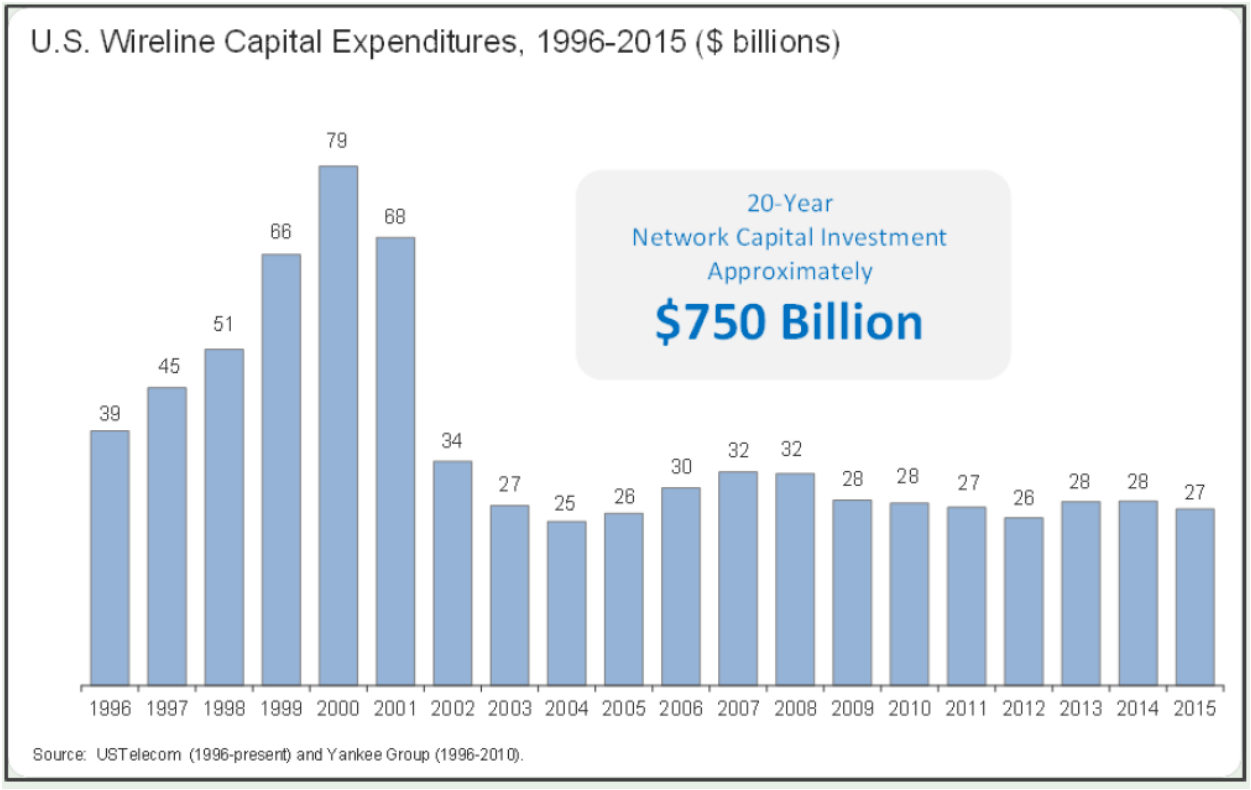


**Figure 4: USTelecom data on wireline capex**

Figure 4 shows the USTelecom data on wireline capital expenditures.[259] The average investment for the Title II period 1996-2005 (excluding 1999 and 2000 as Dr. Singer suggests) is $39 billion. For the Title I years 2006-2015, average investment is $28.6 billion. This data also undermines Dr. Singer's claims.[260]

Dr. Singer acknowledges that his conclusions regarding the impact of Title II on investment are highly sensitive to his choice of periods of comparison: "a comparison of the 2001-05 average ($22.8 billion) to the 2006-10 average ($21.3 billion) implies that Title II had no material effect on Bell investment."[261] So ultimately, while Dr. Singer asserts that relative to 2014, broadband

[259] Patrick Brogan, "Broadband Investment Ticked Down in 2015," Research Brief, December 14, 2016, p. 3. https://www.ustelecom.org/sites/default/files/Broadband%20Investment%20Down%20in%202015.pdf
[260] The average for the period 1996-2005, including the 1999 and 2000 data is $46 billion.
[261] *Id.*

investment in the U.S. has declined,[262] the best he can do is admit that his "natural experiment" might show no Title II impact at all. Dr. Singer again provides this Commission with no meaningful information to support the claim that Title II, or the *2015 Title II Order* has harmed investment.

## C. CALInnovates' Carlton/Keating investment paper is not reasonably supported

CALInnovates, an organization which lists AT&T as a sponsoring member,[263] provides a paper by two additional Compass Lexicon economic consultants, Dennis Carlton and Bryan Keating.[264] The *CALInnovates/Compass Lexicon* paper draws from many of the same sources discussed above, and thus does not support the proposition that Title II has had a negative impact on broadband ISP investment.

The *CALInnovates/Compass Lexicon* paper devotes much of its efforts to a very high-level review of regulatory principles, beginning with railroad regulation and the Interstate Commerce Act of 1887.[265] *CALInnovates/Compass Lexicon* also provide a general discussions of "the economics of regulation,"[266] "the effects of regulatory imperfection on investment,"[267] "the effects of regulatory imperfection on quality,"[268] "the effects of regulatory imperfection on competition and entry,"[269] "the costs of regulation,"[270] and "cost-benefit analysis of utility-style

[262] Singer comments, p. 10.
[263] http://www.calinnovates.org/members/
[264] Dennis W. Carlton and Bryan Keating, "An Economic Framework for Evaluating the Effects of Regulation on Investment and Innovation in Internet-Related Services," July 14, 2017. Hereinafter, *CALInnovates/Compass Lexicon*.
[265] *CALInnovates/Compass Lexicon*, p. 4.
[266] *CALInnovates/Compass Lexicon*, pp. 9-10.
[267] *CALInnovates/Compass Lexicon*, pp. 11-12.
[268] *CALInnovates/Compass Lexicon*, pp. 12-15.
[269] *CALInnovates/Compass Lexicon*, pp. 15-16.
[270] *CALInnovates/Compass Lexicon*, pp. 16-17.

regulation."[271] None of these topics directly address the impact of the *2015 Title II Order* on broadband ISP investment.

*CALInnovates/Compass Lexicon* premise their general discussion with a statement that indicates that they view the *2015 Title II Order* as something that it is not—a comprehensive application of Title II regulation:

> Utility-style regulation such as that imposed under Title II, including elements such as price or entry rules, non-discrimination requirements, prohibitions on "unjust or unreasonable" charges and terms, or resale/unbundling requirements, in combination with a regulatory framework that allows for broad discretion in its implementation, can be expected to reduce incentives to invest and develop high-quality and innovative products and services. The costs to society's welfare from delayed innovation in rapidly changing industries that require on-going investment such as the Internet are likely to be especially high.[272]

As is very clear from the forbearance provisions contained in the *2015 Title II Order*, the price/entry/resale and unbundling provisions that might be associated with Title II have not been applied to broadband providers.[273]

**1. *CALInnovates/Compass Lexicon* rehashes the "usual suspects" on investment**

When finally addressing the "empirical evidence" regarding the impact of the *2015 Title II Order* on investment, the *CALInnovates/Compass Lexicon* paper does not provide any original evidence, citing to other sources instead. For example, *CALInnovates/Compass Lexicon* relies on the 2017 Brennan paper discussed above, and reiterates the erroneous claim that there have been only four instances where network neutrality principles have been violated.[274] Next, *CALInnovates/Compass Lexicon* turn to the 2017 *Hazlett/Wright* paper, also discussed above, to

[271] *CALInnovates/Compass Lexicon,* pp. 17-18.
[272] *CALInnovates/Compass Lexicon,* pp. 3-4.
[273] See, *2015 Title II Order*, ¶¶434-536.
[274] *CALInnovates/Compass Lexicon,* p. 23, citing to Timothy Brennan (2017), "The Post-Internet Order Broadband Sector: Lessons from the Pre-Open Internet Order Experience," *Review of Industrial Organization*, 50(4):469-486 at 471-472.

support the proposition that Title II has been exclusively associated with a negative impact on investment.[275] As discussed above, the *Hazlett/Wright* paper provides analysis that clearly shows that high levels of broadband investment have been associated with Title II regulation.

*CALInnovates/Compass Lexicon* also point to research by Gregory Crawford on the impact of regulation on the cable industry.[276] The Crawford paper focuses on price regulation for programming in the cable industry, and concludes that consumers prefer unregulated cable services.[277] Crawford's research, however, pays little heed to the impact of over-the-top video on video competition, and it is very clear that consumers prefer video competition to video monopoly or duopoly.[278] This video competition is promoted by the framework of the *2015 Title II Order*.

Crawford does point to the positive impact of facilities-based overbuilding by a wireline video provider:

> Evidence from duopoly ("overbuilt") cable markets is robust: an additional wireline competitor lowers cable prices, with estimates ranging from 8 percent to 34 percent.[279]

*CALInnovates/Compass Lexicon* acknowledge Crawford's conclusions on this matter,[280] and AARP certainly agrees that where facilities-based competition has emerged, consumers are

[275] *CALInnovates/Compass Lexicon*, p. 23, citing to Thomas W. Hazlett and Joshua D. Wright (2017), "The Effect of Regulation on Broadband Markets: Evaluating the Empirical Evidence in the FCC's 2015 'Open Internet' Order," Review of Industrial Organization, 50(4): 487-507 at 491.
[276] *CALInnovates/Compass Lexicon*, p. 25, citing to Gregory S. Crawford (2014), "Cable Regulation in the Internet Era," in Economic Regulation and Its Reform: What Have We Learned?, Nancy L. Rose, Ed., University of Chicago Press, Chapter 3, pp. 137- 193.
[277] *CALInnovates/Compass Lexicon*, p. 25.
[278] "Why Netflix's huge subscriber beat is even more impressive than normal," *CNBC*, July 17, 2017. "The entire cable industry is starting to be decimated by Netflix. Millennials don't buy cable anymore because there is actually all the content you need on Netflix and HBO. Now this phenomena has gone global." http://www.cnbc.com/2017/07/17/netflixs-huge-subscriber-beat-is-even-more-impressive-than-normal.html
[279] Gregory S. Crawford (2014), "Cable Regulation in the Internet Era," in *Economic Regulation and Its Reform: What Have We Learned?*, Nancy L. Rose, Ed., University of Chicago Press, Chapter 3, p. 138.
[280] *CALInnovates/Compass Lexicon*, p. 25.

better off. However, as discussed by AARP in opening comments, facilities-based entry in wireline broadband markets is rare.[281]

**2. *CALInnovates/Compass Lexicon's* "waterbed" does not hold water**

The *CALInnovates/Compass Lexicon* paper, in an effort to demonstrate that regulation of broadband Internet access services will also negatively impact edge providers, points to the research of another *Compass/Lexicon* consultant, Michael Katz, who discusses the so-called "waterbed effect" in a 2017 paper.[282] Leveraging Katz, *CALInnovates/Compass Lexicon* attempt to support the proposition that price regulation on one side of the two-sided broadband platform will result in incentives to raise prices on the other side of the market.[283] In other words, if broadband providers are prevented from charging higher prices to one side of the market, they will simply charge higher prices to the other side of the market. C*ALInnovates/Compass Lexicon* argue that the *2015 Title II Order*, could lead to "regulation that prevents BIAS providers from charging certain fees to one side (*e.g.*, usage-based billing to end-users)."[284]

*CALInnovates/Compass Lexicon* then argue that if prices are constrained on one side of the market, that prices on the "other side" of the market will be higher—a "waterbed effect."[285] However, to build their two-sided pricing argument, *CALInnovates/Compass Lexicon* ignore the fact that the *2015 Title II Order* exercised forbearance on the matter of price regulation;[286] they further ignore the fact that the FCC has not made any attempt to regulate end-user prices; and they further ignore the fact that broadband ISPs already have imposed usage-based billing on

[281] AARP comments, pp. 73-77.
[282] *CALInnovates/Compass Lexicon*, p. 22, citing to Michael L. Katz (2017), "Wither U.S. Net Neutrality Regulation?" *Review of Industrial Organization*, 50:441-468. On Michael Katz's affiliation, see: http://www.compasslexecon.com/professionals/bio?id=119
[283] *CALInnovates/Compass Lexicon*, pp. 21-22.
[284] *CALInnovates/Compass Lexicon*, p. 21.
[285] *CALInnovates/Compass Lexicon*, p. 22.
[286] *2015 Title II Order*, ¶37.

end-users, in both wireless and wireline markets.[287] Given these facts, there appears to be no motivation for higher prices to edge providers as *CALInnovates/Compass Lexicon* claim.

Furthermore, the so-called "waterbed effect" has not generated consistent outcomes. For example, the waterbed argument was utilized by wireless telephone companies in Europe to support the proposition that terminating access charges should be kept at high levels.[288] The argument advanced by these companies included the claim that if terminating charges paid to wireless carriers were not kept high, then companies would be less likely to compete for customers by offering them low prices, or other incentives like subsidized handsets.[289] However, the "waterbed" theory has not yielded consistent results in wireless markets. For example, in the U.S. mobile-to-mobile termination rates have been the lowest among OECD nations for an extended period,[290] and during that period, consumers in the U.S. were enticed by subsidized handsets and unlimited usage plans.[291] In other words, contrary to the "waterbed" theory, relatively low termination charges were paid by wireless carriers and relatively low retail prices for end-users are observed in the U.S wireless market.[292]

In summary, AARP does not find that the *CALInnovates/Compass Lexicon* paper adds much to the discussion. *CALInnovates/Compass Lexicon* rehash the conclusions of other papers which also fail to support for the proposition that the *2015 Title II Order* has harmed investment.

[287] See, for example: "Sorry, It's Time to Start Counting Gigabytes at Home, Too," *Wired*, June 1, 2016. https://www.wired.com/2016/06/sorry-time-start-counting-gigabytes-home/
[288] See, for example, "Regulating the mobile phone industry: beware the 'waterbed' effect," *CentrePiece*, Autumn 2007. Available at: http://cep.lse.ac.uk/pubs/download/cp238.pdf
[289] See, for example: Jongyong Lee and Duk Hee Lee, Asymmetry of Mobile Termination Rates and the Waterbed Effect, 23rd European Regional ITS Conference, Vienna, Austria, 1-4 July 2012.
[290] See OECD data, "Historical MTR data from 2004 to 2015" (Figure 4.6), available at: http://www.oecd.org/sti/broadband/newoecdreportreleasedondevelopmentsinmobileterminationrates.htm
[291] U.S. retail mobile rates are also ranked at the lower end of OECD nations. See data available at: http://www.oecd.org/sti/broadband/price-baskets.htm
[292] Relative to OECD retail price data, referenced above.

However, AARP agrees with *CALInnovates/Compass Lexicon* where they state: "When, despite its problems, regulation is needed to address certain issues, as a general matter, regulation should be used to target specific problems in such a way as to develop clear "rules of the road" and minimize uncertainty."[293] AARP believes that the *2015 Title II Order's* bright line rules and forbearance provisions deliver the needed rules of the road with a light regulatory touch that targets specific problems arising from edge provider incentives, and thus supports the virtuous circle.

## XVI. Summary—broadband ISPs and their supporters do not show a negative impact on investment

As discussed above, the studies submitted by broadband ISPs and their supporters do not provide any convincing evidence that the *2015 Title II Order* has harmed investment by broadband ISPs. Even if the scope of the Commission's responsibility regarding the evaluation of the public interest surrounding enforceable open Internet rules were the impact on carrier investment alone, there is no evidence to support the carriers' claims that investment has been harmed. However, the Commission also has the responsibility, as part of a public policy evaluation of the *2017 NPRM's* proposal to overturn the Title II foundation, to consider investment (and other factors) from a broad perspective—considerations on edge providers, consumers, and innovation must be broadly framed.[294] Given the absence of evidence that broadband ISP investment has been harmed by the *2015 Title II Order*, the costs of Title II cannot be said to outweigh the benefits of ensuring that enforceable rules of the road are in place to protect the virtuous circle that generates substantial benefits for innovation, competition, and the economy.

[293] *CALInnovates/Compass Lexicon*, p. 3.
[294] AARP comments, pp. 48-50; Consumers Union comments, pp. 7-8; Greenlining comments, pp. 11-12.

## XVII. Open Internet rules cannot be reasonably supported without Title II

The record in this proceeding clearly illustrates the need for open Internet rules. In opening comments, AARP discussed alternative paths, other than Title II, that might support open Internet rules. AARP concluded that these alternatives would not provide a reasonable foundation to protect an open Internet.[295] Parties like AT&T[296] and Comcast[297] suggest that the Commission should adopt the discrimination and fast lane approach that the Commission floated in the *2014 Open Internet NPRM.*[298] Using such an approach is fraught with pitfalls, and the details of implementing a set of bright line rules based on discrimination and individualized bargaining all point to the ultimate need for Title II authority. For example, suppose that fast lanes are allowed, how would the Commission ensure that non-fast-lane services performed reasonably, and would not be subject to manipulation by broadband ISPs? To solve this problem, the *2014 Open Internet NPRM* proposed a "minimum level of access" requirement for broadband ISPs:

> Requiring this minimum level of access under the no-blocking rule will ensure that all users have access to an Internet experience that is sufficiently robust, fast, and effectively usable. This includes both end-user consumers and edge providers of all types and sizes, including those content providers who do not enter into specific arrangements with broadband providers. In short, our approach will enable consumers to access the content, services, and applications they demand and ensure that innovators and edge providers have the ability to offer new products and services.[299]

[295] AARP comments, pp. 11-36.
[296] AT&T comments, pp. 101-106.
[297] Comcast comments, pp. 58-63.
[298] *In the Matter of Protecting and Promoting the Open Internet*, GN Docket No. 14-28, Notice of Proposed Rulemaking, May 15, 2014. Hereinafter, *2014 Open Internet NPRM.*
[299] *2014 Open Internet NPRM,* ¶98.

This proposal, however, still requires a common carriage foundation to be workable. Such a scheme is destined to fail under Title I. Judge Silberman's dissent in the *Verizon v. FCC* case illustrates why:

> "while there is a possibility that a 'fast lane' Internet service might be offered on a non-common carriage basis, the service that most users receive under this rule would still have to be offered as common carriage, at a regulated price of zero."[300]

Defining a minimum threshold of access, and requiring that the minimum be offered (or exceeded and offered) to all comers indiscriminately and on general terms is certainly in the spirit, if not the letter of, a common carrier requirement.

Judge Silberman also pointed to additional problems with the introduction of fast lanes, combined with a standard that required a "sufficiently robust, fast, and effectively usable"[301] alternative be available to any edge provider who did not want the higher-cost prioritization:

> By exceeding the minimum level of service, the majority suggests, the broadband providers would have wide latitude to engage in individualized bargaining, which might take this rule outside of common carriage per se. *My concern with this hypothesis is that the phrase "effectively unusable" is subject to manipulation.* I think it should mean that whatever speed is generally offered to most edge providers is the minimum necessary to be effectively usable. *After all, it is artificial to distinguish between what is "effective" and what consumers expect. If a faster speed were to become standard, we would likely consider a slower speed to be effectively unusable. . . .*[302]

Judge Silberman's observations identify another set of problems with proposals to utilize a "fast lane and discrimination" approach. If fast lanes are introduced, some standard must be applied to the access that is available outside of a fast lane arrangement. The determination of the effective usability of a service, as noted by Judge Silberman, is an evolving concept that will

[300] *Verizon v. FCC*, 740 F.3d 623 (2014). Silberman, Senior Circuit Judge, concurring in part and dissenting in part, p. 17.
[301] *2014 Open Internet NPRM*, ¶98, describing the conditions associated with a minimum level of access under a no-blocking rule supported by fast lanes and discrimination.
[302] *Verizon v. FCC*, Silberman, Senior Circuit Judge, concurring in part and dissenting in part, p. 17, emphasis added.

affect the relative usability of services. As discussed in AARP's opening comments, there is clear evidence of the dynamic of effective usability.[303] Consumer expectations regarding the performance of their online activities has shown a trend where "inferior" is defined by the speed at which applications, content, or services load into the user's device. As discussed by AARP in opening comments, a few seconds (or milliseconds) delay can result in a decidedly inferior experience for the consumer.[304] Defining an acceptable level of performance for non-fast-lane services would require substantial regulatory oversight, and a Title II foundation.

## A. Comcast, IoT and paid prioritization

Comcast argues that paid prioritization is necessary to enable Internet of Things applications, such as autonomous vehicles.[305] However, under the non-BIAS data service exceptions contained in the *2015 Title II Order*, broadband ISPs already have the ability to offer the type of service that Comcast describes—one that is not designed to reach all Internet endpoints. As noted by the D.C. Circuit, there are two distinct service classifications in the *2015 Title II Order*: (1) broadband Internet access that "includes only those broadband providers that hold themselves out as neutral, indiscriminate conduits," and (2) non-BIAS data services, which do not "offer a standardized service that can reach 'substantially all' endpoints."[306] Certainly, the type of service designed to support autonomous vehicles described by Comcast fits the non-BIAS data service category.

[303] See AARP comments, Section III. B. 2.
[304] AARP comments, pp. 16-17.
[305] Comcast comments, pp. 56-57.
[306] 825 F.3d 674 743 (2016). Citations omitted.

## XVIII. Conclusion—the record shows that the benefits of Title II exceed the costs

From the context of a benefit-cost analysis, the record in this proceeding demonstrates that the costs of enforceable open Internet rules, such as those enabled by the *2015 Title II Order*, are, at most, *de minimis.* The record also demonstrates that the benefits of enforceable open Internet rules are substantial and growing. AARP strongly urges the Commission to reject the *2017 NPRM's* proposals, and to continue to support the rules established with the *2015 Title II Order*, using the Title II classification that has been demonstrated to provide the needed legal foundation. This course of action will protect the expansive benefits for innovation, competition, economic development, free speech, healthcare, and education that are associated with the permissionless open Internet ecosystem.